The Queensland Naturalist.

JOURNAL OF THE QUEENSLAND NATURALISTS' CLUB AND NATURE-LOVERS' LEAGUE.

VOL. VII. MARCH, 1929. No. 1

PROCEEDINGS.

EVENING MEETING, 19th NOVEMBER, 1928. The President (Mr. J. E. Young) occupied the chair. Miss Flynn (Greenslopes) was nominated for membership by the President, and Mr. Huelin (of the University) by Dr. F. W. Whitehouse.

Mr. G. H. Barker gave an interesting account of the birds seen on Enoggera Reservoir, and remarked that the officers at the Reservoir seem to be careful that the birds are not disturbed, and the sanctuary laws carried out as far as possible.

Dr. E. O. Marks showed specimens of granite found at Enoggera, and spoke of the geology of the district.

The President (Mr. J. E. Young) reported that a very enjoyable week-end had, at the invitation of Mrs. S. Curtis, been spent at "Hope Dale," Albert River, by several members. Mr. J. Nebe showed photographs taken during this outing.

Dr. F. W. Whitehouse gave an interesting lecture on "Cambrian Fossils," illustrating his remarks by means of slides. In the course of his lecture, he said that in the Cambrian period, which is the earliest geological period in which there is a satisfactory record of diverse organic life, the fauna was of a complex type, which must have had ancestors, and must have left descendants. The latter can be traced to some extent in the fossils of succeeding periods. The paucity of fossils in the pre-Cambrian rocks is one of the puzzles of palaeontology. The fauna of the Cambrian is known to include representatives of nearly all the invertebrate phyla. In most areas of Cambrian sediments the fossils found represent only a few phyla, in which the individuals had developed fairly substantial hard parts. In one or two rare areas conditions were suitable for the preservation of the soft parts of the fossils, and in these regions a great diversity of rare types have been found. This suggests that in the pre-Cambrian very few of the invertebrates had secreted hard parts.

The study of Cambrian fossils suggests that Western America was the home of the earliest fauna, and that the other regions of the world were populated by migrations from this region.

EXCURSION, 16th FEBRUARY, 1929.

Sherwood Forest Park.

Under the leadership of Mr. E. W. Bick a large number of members visited the above arboretum to view the growth of the young trees and note the progress made in the formation of the park. After the inspection, members were entertained at afternoon tea by Mr. and Mrs. J. E. Young.

A movement for the establishment of an arboretum in Brisbane was started by a letter written by Mr. C. T. White (Government Botanist) to the Brisbane daily papers on the 13th July, 1922. This was followed by one to the then Mayor (Ald. H. J. Diddams), the proposal being to utilise Victoria Park for the purpose.

The movement was further sponsored at meetings of the Empire Forestry Association and other scientific bodies in Brisbane. This was followed by a deputation to the Mayor (Ald. H. J. Diddams) of representatives of the Royal Society, the Queensland Naturalists' Club, the Horticultural Society, the Empire Forestry Association, the Horticultural Society of Queensland, the Australasian Association for the Advancement of Science, and the Public Health Association. In reply, the Mayor, supported by several aldermen, stated that the Council had other proposals regarding Victoria Park, but suggested One Tree Hill Reserve as a suitable site. This was not agreeable to the deputation, as it was thought that the One Tree Hill Reserve was the only piece of natural forest in the immediate vicinity of Brisbane, and it was a pity to disturb it in any way.

The matter lay dormant for a few years, until the early part of 1924, when Mr. F. O. Nixon mentioned at a meeting of the Queensland branch of the Empire Forestry Association that the Sherwood Shire Council had recently obtained an area of 37 acres, which they intended to devote to ordinary park purposes, and suggested that some of the members of the Association should visit the park with the Chairman of the Shire Council and try and induce him to recommend to his Council that it should be devoted to an arboretum for the growth of Australian trees. The Council agreed to the proposal, and the arboretum was officially started by a planting ceremony on the 21st March, 1924, when an avenue of Kauri Pines (Agathis robusta) was planted by the Governor (H.E. Sir Matthew Nathan) and representative citizens. Seventy-two trees were planted, forming the Nathan

Avenue. A second planting ceremony took place on 21st August, 1925, by students of the Sherwood Public School, 100 trees being planted, representing about fifty species. Very soon after this the Sherwood area came under the jurisdiction of the Greater Brisbane Council, and the Sherwood Forest Park, or Sherwood Arboretum, became part of the ordinary parks system of the city. It was placed under the management of the Curator of the Botanic Gardens (Mr. E. W. Bick), and up-to-date sites for about 1,000 trees have been pegged out. About 600 trees, representing between three and four hundred species, have been planted. The soil is good, and most of the trees are making good growth.

The Conifers are represented by the avenue of 72 Kauri Pines, by several species of Cypress Pines, the two native species of Araucaria and two native species of Podocarpus. The Eucalypts or Gum Trees are represented in single trees and groups by about 50 species; Acacias or Wattles by a similar number. Other groups are represented by Figs, Sterculias, Macadamias, Callistemons, Casuarinas, and Eugenias. Among some of the interesting trees already in the Arboretum are specimens of such well-known species as the Western Mulga, the Queensland Beech (Gmelina), the North Queensland Maple (Flindersia Brayleyana), Silk Wood (Flindersia Pimenteliana), the common Turpentine (Syncarpia laurifolia), the Fraser Island Turpentine (Syncarpia Hillii), the Queensland Bean (Castanospermum), the Yellow Wood (Flindersia Oxleyana), the Red Cedar (Cedrela), the Johnstone River Almond (Elaeocarpus Bancroftii), the Whitewood (Atalaya), the Pink Oak (Embothrium Wiekhamii), etc.

ANNUAL MEETING, 18th FEBRUARY, 1929. The President (Mr. J. E. Young) occupied the chair. The President referred sympathetically to the death of Mr. R. Illidge, those present standing in silence for a few moments as a mark of respect to his memory.

A welcome was extended to Dr. Fraser, who is on her way from England to join the British Barrier Reef Expedition at Low Island.

Miss Flynn (Greenslopes) and Mr. Huelin (University) were elected members of the Club.

The honorary secretary read the 23rd Annual Report.

The Report of the Nature Lovers' League Committee was read by Mr. D. A. Herbert.

The Librarians' Report, read by Miss Wegner, showed that almost two hundred (200) books, magazines, and pamphlets had been received, and about 100 borrowed by members.

The Financial Statement, duly audited, read by the acting treasurer (Mr. J. C. Smith), showed a credit of £26/4/5 for the Queensland Naturalists' Club, and £10/8/4 for the Nature Lovers' League. Mr. Tryon raised the question of financial aid from the Government. As none has been received, he made a recommendation to the incoming council to enquire if aid could be obtained.

On the motion of Mr. Barker, seconded by Mr. Tryon, it was decided that a letter of appreciation of his work as hon. treasurer, and sympathy in his illness, be written to Mr. F. B. Coleman.

Office-bearers were elected for the ensuing year, as set forth on the cover of this issue.

Mr. J. E. Young (the retiring President) gave an interesting account, illustrated by lantern slides, of the natural history of Low Island. Mr. H. A. Longman, in moving a vote of thanks to the lecturer, said that Mr. Young, by his work on Low Island, had earned the gratitude of the Barrier Reef Expedition party. Dr. E. O. Marks seconded the vote of thanks, which was carried by acclamation.

A letter by Mr. H. G. Barnard on "goannas" or monitors, was read by the President. Mr. H. Tryon moved, and Mr. G. H. Barker seconded, that a sub-committee should be formed to deal with the question. Messrs. H. Tryon, H. G. Barnard, J. E. Young, and H. A. Longman, with power to add, were elected as the committee.

A series of photographs were tabled by Mr. J. Nebe.

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A SANCTUARY FOR QUEENSLAND FAUNA.

For some time past Mr. A. S. Le Souef, the director of the Taronga Park Zoological Gardens in Sydney, has been investigating the fauna on Hinchinbrook Island and the adjacent islands, with the view of determining the association between these islands and the mainland from a zoological point of view. During his stay in Brisbane Mr. Le Souef delivered a short address before the Council of the Queensland Naturalists' Club, in the course of which he made a strong plea that Hinchinbrook Island,

North Queensland, should be constituted a sanctuary for various species of Australian fauna, whose extinction is threatened. If specimens of these animals were placed on Hinchinbrook Island they would stand a good chance of multiplying, as since the removal of the natives from the island the fauna is dominated only by the 20ft. python.

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CORRESPONDENCE.

Jacana: Bandicoots.

Among letters recently received by the Council, the following extract from one received from Messrs. W. G. and R. C. Harvey, Marwood, Mackay, is printed herewith, and may be of general interest:—

"The Jacana is not a very large bird, but it is rather showy in its plumage, and somewhat unique in its habitat. It is never found away from waterlily lagoons, creeks, and ponds. Even its nest is built amongst the floating water-weeds, and sometimes it is built so close to the water that some of the eggs are partly immersed during the whole period of incubation.

"The wetting of the eggs, however, does not prevent them from hatching. Jacana's nests are often raided by water rats, and we have frequently seen their beautifully-veined egg-shells adorning the feeding tables of these nocturnal raiders.

"Owing to the abnormally dry season (written 27/10/28) there has been a phenomenal invasion of bandicoots to this district. Our place is completely overrun with them, and according to reports of the various district correspondents of the Mackay "Daily Mercury," the invasion appears to be general all over the district. It is nothing unusual to see half a dozen bandicoots together in our kitchen in search of food, while others may be heard in the storeroom tearing holes in the bags of pollard and maize.

"Outside, the paddocks are literally alive with them. They have been very destructive to the sugar-cane and other crops, and consequently the Cane-Pests Destruction Authorities are paying one shilling each for their scalps.

"The worst feature of the bandicoot plague, however, is the way they have eradicated the ground-nesting birds. They have been particularly destructive to the Pardalotes, and as far as we can judge, not one nest of these birds has escaped destruction."

NOTES ON THE NATURAL HISTORY OF LOW ISLAND, THE HOME OF THE BARRIEF REEF SCIENTIFIC EXPEDITION.

By J. E. Young.

(Presidential Address delivered before the Queensland Naturalists' Club, 18th February, 1929.)

Now that Low Island has beeome so widely known as the seene of operations, or perhaps I should say, of investigations of the Great Barrier Reef Expedition, it may not be out of plaee to give some little deseription of it, and to mention some of the more notieeable features of its natural history, most of the reports so far having been devoted to the aetivities of members of the party at present domieiled there.

The first mention we have of the Island is by Captain James Cook, who, aeeompanied by the famous botanist, afterwards Sir Joseph Banks, and by Dr. Solander, a Swedish Botanist attaehed to the British Museum, passed it in 1770, on the morning of the very day on which he eame to grief on Endeavour Reef.

Leaving the entranee to what is now known as Mission Bay, just outside the present Cairns, at 4 a.m., on June 10, he says: "We eontinued steering N.N.W.$\frac{1}{2}$W. as the land lay . . . At ten we hauled off North in order to get without a small low island, whieh lay at about two leagues' distanee from the main, and a great part of which, at this time, it being high water, was overflowed. At three leagues to the N.W. of this island, elose under the main land, is another island, the land of whieh rises to a greater height, and whieh at noon bore from us N.55W. distant 7 or 8 miles. At this time our latitude was 16 deg. 20 min. S. Cape Grafton bore S.29E. distant 40 miles."

All these statements indieate without doubt that the small low island was the one now named Low Island, and the seeond one eorresponds with Snapper Island in deseription and latitude.

Continuing northward, Cook apparently sighted Hope Islands about 6 in the evening, and grounded on the reef just before 11 that night. I mention these points at length as an artiele in a eurrent magazine evidently gives an ineorreet quotation from Captain Cook's log regarding the island.

Low Island is only 7 or 8 miles from Port Douglas, a once prosperous and busy port for the goldfields and tableland generally, before Cairns came into existence. It is also about a similar distance from the mouth of the Daintree River, a district now increasing in importance by reason of a butter factory and a certain amount of timber trade. The main route to the North is close to the Eastward, and large steamers are frequently seen passing.

Exactly how much Low Island may have grown or otherwise altered since Cook's time, it would be hard to say. It would probably be safe to assume that even then, some part of it, at all events, was more or less covered with vegetation, otherwise Cook might have called it a reef or bank in referring to it; the statement that it was in great part overflowed., it being high water, rather aptly describes it at the present day. The fact that there is 150 years of coral growth to account for may be explained by the surplus being constantly removed from the surface into neighbouring deep water, by action of the elements, or by subsidence. However, such problems are for the scientists engaged on these questions to elucidate.

The general form of the reef on which the island stands is somewhat heart shaped, approximately a mile from E. to W., and nearly 1½ miles from N. to S.

About midway on the Northern side is the island proper, the only habitable portion, and having an area of about 3½ acres, oval in shape, barely 150 yards from E. to W., and about 100 yards from N. to S., nearly level, and only a few feet above high water spring tides.

On this islet, under normal conditions, are erected the lighthouse, built about 1877, and 3 lighthouse-keepers' residences; but now, in addition, are the quarters of the scientific expedition, located along the Southern and Southwestern sides.

The sea has not come over the islet since a cyclone some 20 years ago, when waves swept right across and through the low-built houses, but luckily doing no great damage. At such times it might be mentioned that the inhabitants take refuge in the strongly-built lighthouse, until all danger has passed.

Adjoining the island is the harbour, small, and dangerous to strangers, owing to the presence, in places, of "nigger heads" of coral, but affording good anchorage for boats up to 50ft. at all times, except when a Northerly blow is on, which only occurs during the summer or North-west season.

The foundation of the island, judging by what is seen on the beach, and probably on the whole reef, consists of layers of coral naturally cemented into a concrete, much of which is as hard as the manufactured article.

On this is the pure coral and shell sand, of which the islet is composed.

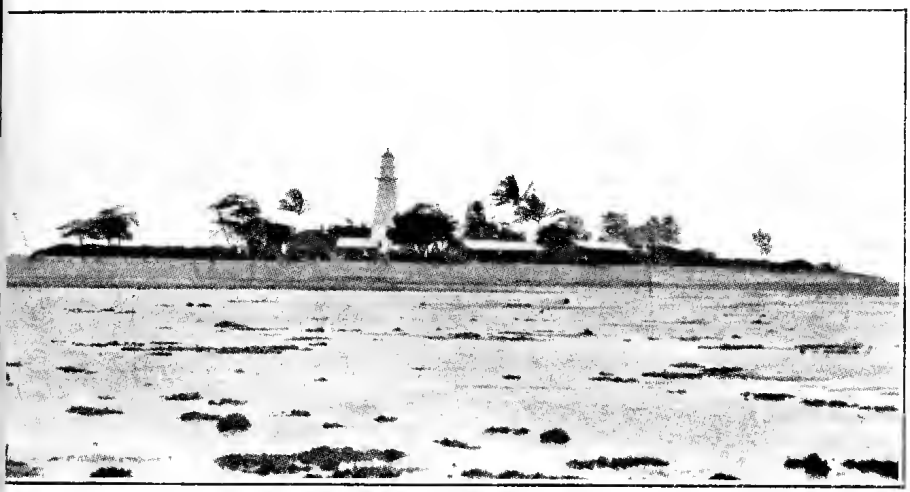
The E. and S.E. beaches of the reef are of solid wind and and wave-swept coral, rough under foot, and rather bare of life above low water mark. Around high water mark there are various cyclone drifts, in some cases resembling new made roadways of driven and broken white coral a few yards wide, perfectly level, and perhaps 2 or more feet in height above the solid portions. These drifts join up with a narrow ridge of similar material running parallel with the sea. This ridge serves as a protecting bulwark for the greater part of the lagoon and islet, and also forms the Eastern boundary for the mangrove area, which consists of a belt up to about 300 yards in width.

The coral in ridges and in places in heaps is mostly hard branches, which ring almost like steel, and have the somewhat weird appearance of heaps of bleached bones.

From the islet, extending away to the S. and S.W. almost to the reef edge, is an extensive flat, more or less dry at low water, and covered at high water; in this area is much loose dead coral rock, and in the pools growing coral: Eastward to the mangroves are sandy flats, merging into a lagoon area around the Southern end of the mangrove, though only some foot or two in depth at low tide, there being another smaller lagoon near the N.E. spit.

These lagoons abound in life of various kinds, though the heat of the water in such confined and shallow areas is often much above the ordinary. Here are certain varieties of coral in patches, with fish darting from one shelter to another, large anemones, with their exquisitely coloured commensal fish, and phantom-like prawns. Contrary to Saville Kent's statement, **both** of these were found in association with a single anemone, on more than one occasion, crabs of many kinds, beche-de-mer, and other holothuria, a few molluscs, including a poor variety of pearl shell, sponges of various kinds, the tests of whose quality have not yet been recorded.

Among the rocks and more broken pools towards the Westward side, are to be found great varieties of life:



Low Island, North Queensland.

Corals at Low Tide, Low Island, North Queensland.

[Photos by J. E. Young

fish, crabs, shrimps, holothuria, all in many and varied colours, one species of the latter, snake-like, and appearing to consist of a mere tube of skin; others exuding strings of white and stieky matter when touched; molluscs, some free swimming, such as the beautiful Lima . . . . which lurks under the blocks, others without shell, squid, octopus up to 7ft. across, sea hare, star fish from bright blue to sandy colour, sea urchins with short brown spines, and others with black spines nearly a foot in length, brittle and poisonous, sea snakes and blue spotted rays, and many other species.

Of Gasteropods there are not so many as in some places. A few are Trochus, Mitra, Clava, Terebra, Cyprae, Ovula, Natica, Strombus, Pyrazus Delphinula, Conus, Oliva, etc., and of bivalves: Oysters of various kinds, including an inferior variety of Pearl, Perna, Lima, Spondylus, Tellina, with its strangely twisted tip, and Lithodomus was found boring in the rock. Chitons were also in plenty on the rock masses.

In the outer edges of the reef, where the water is constantly moving, are other forms, though it is not so easy to see or obtain them.

Worms of various kinds are to be found, including a striped black and white Nemertine on the sand, two or three yards in length, and a quill in thickness, some forming their own spiral shells on coral blocks, and again other kinds boring holes in coral masses and showing only their flower-like tentacles in many colours, only to disappear like a flash when touched.

Corals themselves are in great variety, and of every colour and shape; branched, ear and plate shaped, brain coral, solid rock masses, the plainest of all, a marvel of beauty and construction when seen under a lens.

Fish, edible or otherwise, were not so greatly in evidence as might be imagined. It is stated by residents that since the cyclone of some 2 years ago, the fish seem to have left the locality, whether by reason of destruction of food, or other causes, it is difficult to say, but it would be the source of an interesting investigation to determine the reason, if it were possible. Comparatively few have been caught for food, and these mostly whiting, while mackerel can sometimes be got by trolling line around the reef.

A few whales, notably a cow and calf have been seen around on several occasions feeding, or perhaps scratching themselves on the nigger heads around the reef, and

on one occasion playing lazily about the harbour mouth, rolling over, and sporting about generally.

A specimen of the green turtle was secured by the boys early in September, and besides providing some excitement, made a welcome change in the food supply.

Entomology is by no means well represented. A few butterflies were seen travelling, and in fact, are often met with when out in boats, frequently some miles from land, whither they go or come I know not, and surely many perish.

There is a variety of cricket on the islet of which we were warned, as it was reputed to eat holes in any garments left on the floor or ground. Mosquitoes are rare, none being seen during my stay, though I am informed that a very few have been noticed since.

Botanically, the island is too small to be very rich in varieties, and human habitation may have a somewhat deterrent effect.

The predominant feature is naturally the dozen or so of coconut palms, now well grown and fruiting. The only other tree of any number and size is Terminalia melanocarpa (blue plum), a native tree, providing a welcome shade with its large leaves, which turn yellow and gold before being shed. Two specimens of Casuarina equisetifolia, or horse tail oak, and a couple of scrub trees with smallish leaves, which I had no means of identifying, completes the list of trees.

Besides these there is a fair abundance of bushes and undergrowth, all kept religiously cut to about 4ft. in height, to allow of constant observation of the sea, while at the same time forming a splendid wind break.

Amongst these are the Scaevola Koenigii, thickly massed along the Southern and Western sides, Clerodendron inerme on the North, with Terminalia, dwarfed from cutting, Tournefortia argentea, and one or two other bushes common in these parts. I was surprised at not seeing Sophora tomentosa, which is found on Snapper Island, near by.

The creeper, Ipomea Pescaprae, was fairly common growing on the sand, and Cassytha filiformis, a dodder-like plant, in places climbing over the Scaevola and Ipomea, while Euphorbia atoto was noticed in one section.

Grasses are few, Red Natal Grass (Tricho aena) being common, and evidently arriving per medium of packing cases, and one or two native grasses peculiar to sandy beaches.

All the above are on the Islet proper, the other wooded portion, ½ mile distant, being mainly a belt of mangroves, principally composed of Rhizophora muchonata, with its arched roots forming an intricate network at some distance above the mud.

In this mud swamp is a small area, more shingly in nature, where 3 or 4 other forms of beach bushes have collected, and on the exposed reef outside the coral ridge is a considerable area of what appears to be the Ficoid Sesuvium portulacastrum, while the common dugong grass (Zostera) is to be found in places around the lagoon.

Bird life, during the period in which I was on the island, May—September, was not very abundant, land birds being particularly limited in species. The Mangrove Kingfisher (Halcyon sordidus) was fairly common around the mangrove area, feeding on the flats at low tide, and doubtless breeding later in the hollow spouts of decaying mangrove branches. A single specimen of the Magpie Lark (Grallina), which was evidently marooned, was always about.

The varied Honey Eater (Meliphaga versicolor) was the most abundant, and no mean singer either. A listener awakening at the first streak of dawn, would hear a low croon coming from some nearby bushes, the voice gradually growing in volume as the light increased, until by the time the sun should be making its appearance, the feathered songster would be fairly shouting aloud with joy and anticipation of another day, this being magnified many times according to the number of performers, provided a concert worth listening to. Owing to the scarcity of blossom at the season, I noticed them busily engaged sucking the juices of the ripe Terminalias, and the menu might be eked out by various insects, spiders, etc. As, for instance, the same birds in Cairns were regularly to be seen, of a morning, eating the spiders under the balconies of the hotels.

A few specimens of the white-bellied wood swallow occasionally visited us.

The nutmeg pigeon (Myristicivora bicolor) is a migrant, arriving during September, and nesting in considerable numbers amongst the mangroves. Unfortunately, though protected, these are still destroyed in great numbers during this season.

The white-bellied sea eagle was present, and also nested in the thickness of the mangroves.

The lighthouses take toll of many passing birds at night, especially during misty weather; a specimen of the beautiful little purple-crowned pigeon (Ptilinopus superbus) being picked up dead during my stay.

A number of shore birds, which had not migrated, were about. Amongst these were the sea Curlew (Numenius), Bar-tailed Godwit (Limosa lapponica), Grey-tailed Tattler (Tringa breviceps), Golden Plover (Pluvialis dominicus), and Banded dottrel. In addition to these, the Blue Heron, also the Reef Heron both white and grey varieties (Demigretta greyi and D. sacra cooktowni), ornamented the beach and coral blocks at low tide. Matthews considers these distinct, others not so, the constant association of both colours here might appear to indicate that they are not distinct but variable.

The brown gannet at times made an interesting sight, plunging under the water after fish with great assiduity.

The Sooty tern has since been nesting on the coral spit, I have been informed.

The above list might probably be considerably increased, over a more extended period.

The English members of the party under Dr. C. M. Yonge, who are to be complimented for their zeal under trying conditions, and assisted by Messrs. A. G. Nicholls, of Perth, and F. W. Moorehouse, of Brisbane, have set themselves a task of great magnitude. Mr. Tandy, Botanist, who could only stay six months, was mainly working on marine algae. The others briefly are investigating all the marine life, the water and its chemical variations, and contained plankton, the breeding seasons and foods of the various organisms, and the nature and extent of relationship, as between one and another, so as to gain the fullest possible knowledge, both from a biological and economic point of view. The weather also receives attention, force of wind, temperature, humidity, and by a clever automatic arrangement, the intensity, and actual duration and times of sunlight during every day of the year, are registered.

The fullest results of investigation will not have been worked out for probably a year after leaving here next July. We can only join in wishing Dr. Yonge and his party every possible success in their findings.

My thanks are due to Mr. H. A. Longman, Director of the Queensland Museum, and Mr. C. T. White, Government Botanist, for assistance in determining a number of species mentioned in this article.

ROWLAND ILLIDGE.

On Tuesday, February 19th, 1929, the Queensland Field Naturalists' Club lost one of its most worthy members—one who had worked continuously since its inception—Mr. Rowland Illidge, who passed peacefully away, in his naturalist home—"Aleyone"—by the river, in his seventy-ninth year.

He was one of the sons of Rowland Illidge, a well-known Brisbane business man, who died in January, 1907, aged 83. The subject of this obituary notice was born in the Brixton district, near London, but when only about 7 years of age, voyaged with the family in the Governor Moreton to Sydney, remaining there (at Newtown) for about two years. On arrival here, R. Illidge, senr., and his children resided at Milton, and young "Rowly" attended the old Brisbane Normal School, attaining there such proficiency that shortly after the boys' section of the Petrie Terrace School was opened (March 1868), R. Illidge was appointed its first pupil teacher, a post that he held until the end of 1876, when he resigned.*

Early association with the Department of Public Instruction rendered Illidge long mindful of its interests. Thus, in 1906, in furtherance of the work of the classes formed in various State Schools for Nature Study, he displayed insects at an exhibition of Natural History Specimens at the Technical College. This had reference to seasonal dimorphism in butterflies.

Again at a camp of 40 State School teachers, held at Stradbroke Island under the auspices of the Nature Lovers' League of the Queensland Field Naturalists' Club, in January, 1927, Mr. Illidge was present as an instructor in Entomology.

After leaving the Department of Public Instruction, he joined the railway service, doing duty at Miles. Then, leaving the Government service, he became associated successively with the South Brisbane Insurance Co. and the Commercial Union Assurance Co., with which bodies he saw service for some twenty-five years.

On the marriage of our friend in March, 1885, he took up his abode on the right bank of the Brisbane River at Bulimba, near to where C. Coxen, first curator of the Queensland Museum, resided, introducing native trees

* In May, 1918, he attended the Golden Jubilee of that pioneer educational institution in Queensland as an honoured guest, reading its first roll-call on that occasion.

and plants generally (that still survive), and forming a demesne where the birds and butterflies he loved so well could disport themselves. Here also was reared his family of two daughters and five sons.

R. Illidge's father manifested some interest in butterflies, but home influences apparently did not minister to his early love of birds and insects and Nature's beauty generally.

As a schoolboy he preferred to roam the Three-Mile Scrub (Kelvin Grove) to playing cricket, and during this period (1864) he also visited, for 6 months or so, an uncle who lived at Mt. Ker, an outstation of Clifton, Darling Downs, and here he would repair to King's Creek, close at hand, that a prevalent drought had tenanted with birds he had never seen before, and so proved a great attraction for the young naturalist.

About this time, and whilst still residing with his father at Milton, he must have met Mr. Sylvester Diggles, who dwelt at Kangaroo Point, close at hand, who, as shown by his superb work—"The Ornithology of Australia"—that, however, he was unable to complete, and the fact that from 1858 onwards he collected and forwarded Lepidoptera to the British Museum, was able to direct Illidge to a systematic field inquiry into these phases of natural history. Mr. and Mrs. Coxen's influence must also be taken into account, the latter's especially, in promoting his early attentions as a collector to Conchology.

Meanwhile, he found a congenial companion in J. Sankey (Major Sankey), with whom he became associated in 1871. Not only did he explore, together with Sankey, the surrounding country on foot—Taylor's Range especially—but Illidge had already a boat, and had made visits to the Bay, and had roamed in quest of birds over much of Stradbroke Island. (Vide this journal, vol. v., p. 90, 1926.) He and Sankey again secured an old ship's boat, which they fitted up, and almost every week-end and holiday saw them down the river and further exploring from Amity Point Mandarewa to (Southport). Both Sankey and Illidge himself have narrated incidents that recalled the latter's wonderful walking enterprises, also the proficiency of both at tree climbing, necessitated by the nature of their pursuits—the quest of birds and insects.

When Illidge had found a home for himself, W. H. Miskin was making an intensive study here of Australian butterflies, but we have no evidence yielded by their tes-

Rowland Illidge

1850—1929

From a photograph taken in 1909

timony or personal observation that they at all eo-operated, yet when in 1891 the former published his elaborate "Synonymical Catalogue of the Rhapoloeera of Australia," as also this author's similar Synonymic List of Sphingidae (Hawkmoths), this proved an additional ineentive to the younger worker to still proseeute entomology afield.*

Dr. A. J. Turner's arrival here in 1889, and elose attention to systematie eolleetion and deseription of Lepidoptera—espeeially served to realize the importance of R. Illidge's work also. Meanwhile, Dr. T. P. Lueas, too, took up his abode in Brisbane, and whilst here vied with Illidge in enthusiastie interest in Lepidoptera, and really did eo-operate to the benefit of both; whilst eventually the Illidge eolleetion passed into the former's hands.

R. Illidge was naturally a retiring and very unassuming investigator, a personal qualifieation born of his elose study of birds and inseets in the field work that demands elose individual attention, and is also ministered to by solitariness.

When Dr. T. P. Lueas is deseribing one of R. Illidge's diseoveries—the moth **Culama expressa**—he refers to him as "our most eareful observer." When G. A. Waterhouse states R. Illidge (and three others he names) "have plaeed their eolleetions at my disposal, and given me examples of many rare speeies" (Notes on Australian Rhopaloeera, Lyeaenidae, III, 1903), he expressed what is implied in the single referenee to Illidge in his great work, in assoeiation with G. Lyell, on the Butterflies of Australia, 1914, that we find on perusing its prefaee.

Illidge was a member of the Royal Soeiety of Queensland. In 1898 he was appointed its Honorary Librarian, a post he held for several years. This was some years subsequent to the existenee of the Field Naturalists' Seetion thereof. His eontributions to its transaetions related exelusively to inseets, and are elsewhere alluded to.

On the Natural History Soeiety of Queensland being formed in January, 1892, Mr. Illidge joined the Counеil, whilst for the two sueeeeding periods (1893 and 1894), he was its Hon. Seeretary and Treasurer, and was in 1895 eleeted to the post of President. During its numerous

* It was through R. Illidge's efforts in obtaining the beautiful Lycaenid butterfly that Miskin had wrongly identified with Felder's species **H. narcissus,** that Waterhouse was enabled not only to correct the error, but also to create for our rare Brisbane insect the species **Miletus Miskini.**

sessions he contributed several informative papers, as well as exhibited specimens of special interest. He was also a consistent attendant at its field excursions.

Similarly, in 1907, Illidge associated himself with the present Field Naturalists' Club, Queensland, and served for a long period on its Committee. Since 1907, his connection with the Club, until the last year, had been continuous, and he spared no effort to promote its purposes by attending and contributing to the business of its evening and field meetings.

Mr. Illidge again was an active member of the Gould League of Bird Lovers, and remained associated with it until it was [changed to "The Nature Lovers' League" —Ed.] and amalgamated with, or absorbed by, the Queensland Field Naturalists' Club.

He was a member of the Entomological Society, Brisbane, and read a special paper at its meeting on November 18, 1925, on "Wood Boring Beetles."

In November, 1928, Mr. R. Illidge was elected an Honorary Associate Member of the Royal Zoological Society of New South Wales for "Distinguished Services you have rendered to Australian Zoology." He was the first Associate under the article in the Society's constitution relating to Associate Members.

On October 20, 1928, the Entomological Society of Queensland recorded:—"Some time ago the Constitution of the Society was amended to allow for the election of a limited number of Honorary Members, and Mr. R. Illidge was the first elected as such 'in recognition of his outstanding services to entomological science in Queensland.'"

Rowland Illidge cherished no other feelings towards those—whether young or old—whose predilections for Natural History brought them into contact with him than ones dictated by noteworthy generosity, with all that it implies. The knowledge he secured was ever at the disposal of others, and to them it was freely dispensed. One family of naturalists, living in the Central District —father and mother, daughter and sons, two of whose members have predeceased him—once and for all, therefore, justly held him in the greatest regard. So also generally his ornithologist and entomologist contemporaries, and those to whom the poetry of Nature is an appeal. Many young men who were fortunate to have come under his notice have thus too alike profited. The eldest living of his former associates, R. J. Sankey ("Jim"), referring to the early seventies of the last

century, volunteered the fact that it was his then constant companion, Rowland Illidge, that taught him to see and love the beautiful in Nature. Younger men—entomologists, F. P. Dodd, the late R. Relton, and L. Franzen, the two former of whom sat at his feet as members of the old Natural History Society, the last as a fellow member of his club—were all influenced by Illidge's example, and received inspiration from his teaching.

And this may be said also of bird lovers, who have "come-out" here, from time to time, during the life he lived.

Published Papers.

1. Birds.—Illidge's work regarding birds has been the fruit of his own observations, supplemented by the collection of individual examples bearing on these. The value of these observations—that have been extended over a period of half-a-century—have been fully felt by those ornithologists who have had the privilege of his society in the field or elsewhere, including amongst their number, Sylvester Diggles, L. M. D'Albertis, the visiting members of the R.A.O.U., and later W. B. Alexander and A. H. Chisholm, resident members thereof. With respect to our bird lovers, however, we have only to recall A. H. Chisholm's "tribute of youth,"—and his associated remarks—to R. Illidge to find further eloquent testimony to the latter's ornithological lore and learning (vide "Bird Seeking in Queensland, 1770-1922, this journal, vol. VI, No. 3, 1922). Our Club has enjoyed communications from R. Illidge covering the following topics:—

1. Notes on the Dragon Bird (Pitta strepitans) "Queensland Naturalist," 1/10/22.
2. The Channel Bill or Rain Bird (Scythrops Novae-Hollandiae), Ibid. I, 107, 162.
3. The Blue-faced Lorilet (Oppsitta coxeni), ibid. IV, 113.
4. The Bronze Wing Pigeon, Ibid. IV, 4, 72-74.
5. Birds noted during long holiday excursions from about 1869-1880 (Stradbroke Island), Ibid. I, 144-146.
6. Birds of Stradbroke Island, 1922, Ibid III, 6.
7. Insects and Birds—Cedar Creek and D'Aguilar Range Excursion, Ibid. IV, 34-35.
8. Some recent Avian Visitors, Ibid. V, 1/9/26.

Of these papers, Nos. 3 and 4 are of especial interest—particularly so No. 4—that illustrates the possibility of local bird extermination.

II. Insects.—The greater proportion of R. Illidge's published writings related to insects, and may be grouped for convenience under different headings, as

being ones introduced to those to whom they were addressed.

A.—Systematic Groups.

1. A List of Butterflies of the Brisbane District, with Remarks on Localities and Food Plants. Proc. Roy. Soc. Queensl. XII (1898). (This arranged after W. H. Miskin "list" comprised 137 species).
2. Timber Moths (Hepialidae), Life Histories, Ibid XIV (1899), 21.
3. Australian Wood-boring Hepialidae (with A. Quail), Ibid. XVI, 65, 1901.
4. Wood-boring Cossidae, Ibid. XVII (1902), 16.
5. Xloryctidae, Trans. Nat. Hist. Soc., 1 (1895), 22-25.
6. (a) Insect Notes—Parandra Frenchi, and seven other Beetle Borers, "Q. Nat." IV, 4, 1924.
   (b) Notes on Psychopsidae (Megapsychops, Psychopsis, Euporismus), "Q. Nat.," IV, 4, 1924.
7. Predaceous Ground Beetles, Castelneaudia (Homalasoma, Trichosternus), Brisbane District, "Q. Nat.," II, 97, 1917.
8. Papilionidae, Series 1, "Q. Nat.," VI, 33-39, Ibid. II, 47-52; Ibid. III, 55-58.
9. Trichaulax marginipennis and other Cetonidae, Ibid. II, 53, 1895.
10. Stypholepis (Lep. Schoenobidae), Ibid. IV, 35-36, 1923.
11. The Bag Worm (Thyridopteryx hubneri), Ibid V, 36-38, 1925.
12. Delias Butterfly (2 species), Ibid. II, 74, 1920.
13. Rhopalocera, seasonal form, Ibid. II, 86, 1921.
14. Lucanidae—Noticeable Beetles. (Phalacrognathus, Lamprima). Ibid. II, p. 56.
15. Pyralidae (Lep.), Nat. Hist. Soc., 1895.
16. Wood Boring Insects, Ent. Soc. Brisb., Nov., 1925 (Mimeograph only).
17. Notes on a Nymphalid Butterfly, Q. Nat., IV, 36, 1923.
18. Miscellanea Entomologica (including No. 19), Pro. Roy. Soc. Qld., XVI, 1899, 133.

B.—Insects of Special Plants.

19. Insects of Moreton Bay Fig (Ficus macrophylla). Read Nat. Hist. Soc., 1892 (Title only).
20. Insects of Wattle Trees, "Q. Nat.," III, 61, 1922.
21. Insects of River Mangrove (Aegericas major), Ibid. V, 46, 1925.
22. Notes on Lepidoptera whose Larvae feed on Loranthus, Proc. Roy. Soc. Qld., XX, 1907, 133.
23. Insects visiting ripe grapes (N. sp. Noctuidae), Nat. Hist. Soc.

C.—Insects Associated in Localities.

24. Stradbroke Island, Easter Excursion, 1921, "Q. Nat.," II, 127, 1921.
25. Wellington Point Excursion, Ibid. I, 42-43, 1912.
26. Sandgate Excursion, 1912, Ibid. I, 144-146, 1912.
27. Glass House Mountains Excursion, 1910, Ibid. I, 158.
28. Townsville Insects (rare), Nat. Hist. Soc., April, 1923.
29. Bulimba—R. Illidge's House and Garden (Some City Moths), "Q. Nat.," 1921-1922.
30. Entomology of a Tea Tree Swamp, Proc. Roy. Soc. Qld., XVI, 1900.

31. Bulimba—Insects caught in one day (21/6/1908), in Bulimba Swamp, "Q. Nat.," Ibid. I, 58-59, 1908.
32. Bulimba—Some Insects in R. Illidge's Garden, Ibid. I, 278, 1908.
33. Jandowae Rhopalocera, Feb. and Dec., 1920, Ibid. III, 1921.
34. Some Insects occurring in Brisbane in June, Nat. Hist. Soc., 1893.
35. Noteworthy Lepidoptera, Nat. Hist. Soc., 1894.

Western Australian Entomology.

(NOTE.—R. Illidge visited—during a well-earned leave after a long service in Brisbane—Western Australia, September, 1913—February, 1914.)

36. Western Australian, Notes on My Visit to (Insects and Wild Flowers), "Q. Nat.," II, 24-29.
37. A Western Australian Timber Moth—Charagia nobilis and C. scripta (Hepialidae), Ibid. I, 164, 1910.

R. Illidge's name is commemorated in the moth **genus Illidgea** (Turner), and in the specific names of other insects, e.g., the Lycaenid butterfly Lalmenus illidgie (Lucas, 1889 — I. dameli (Semper, 1889); Arrhodia (?) illidgei, Lucas (1893), Lep. Monocteniadae; Hybrenia illidgei (Carter, 1927); Col. Cistelidae; and Megapsychops illidgei (Froggatt, 1903); Tillyard, 1918. Neuropt. Planipennia. The last named is an extraordinary insect, not only in form, livery, and structure, but — as pointed out by Dr. Tillyard — a very ancient insect survivor that has undergone only the slightest modification since Triassic times, as shown on comparison by him with a fossil insect met with in our Ipswich beds of that geological period and designated Archepsychops triassica, Tillyard, 1919.

R. Illidge's departure from amongst us was finally sudden, though for weeks his condition had been that of an invalid and of a sufferer; but it was only a few days before his passing away, when he was dilating to the writer on the beauty of those special Flower Beetles—the Centonidae—that he loved to the last.

He was interred in the Toowong Cemetery on Wednesday, February 20th, many of his old friends amongst the members of the Club following him to his grave.

One recalled on the occasion the words of the poetess who sang:—

> Ay, men may wonder while they scan
> A living, thinking, feeling man
> Confirmed in such a rest to keep;
> But angels say, and through the word
> I think their happy smile is *heard*,
> "He giveth His beloved sleep."—E.B.B.

HENRY TRYON.

QUEENSLAND NATURALISTS' CLUB.

ANNUAL STATEMENT OF RECEIPTS AND EXPENDITURE, 31st JANUARY, 1929.

RECEIPTS.

	£	s.	d.
To Cash at Banks	30	9	0
„ Members' Subs.	49	5	0
„ Tent Hire	10	19	6
„ Flower Show	29	10	2
„ Sales "Naturalist"		6	3
„ Insurance Refund		2	8
„ Lantern Hire	1	0	0
„ Printing Refund	1	5	0
„ Interest		16	4
	£123	13	11

Credit Balance £26/4/5.

EXPENDITURE.

	£	s.	d.
By Printing "Naturalist"	34	15	0
„ Blocks for "Naturalist"	4	7	0
„ Rent	12	10	0
„ Flower Show	22	17	0
„ Lantern	1	0	0
„ Petty Cash	15	0	0
„ Insurance		11	0
„ Tents	5	0	0
„ Painting, Wreath, etc.	1	9	6
„ Cash at Bank	26	4	5
	£123	13	11

NATURE LOVERS' LEAGUE.

ANNUAL STATEMENT OF RECEIPTS AND EXPENDITURE, 31st JANUARY, 1929.

RECEIPTS.

	£	s.	d.
To Cash at Banks	11	15	5
„ Sales Certificates	3	7	11
	£15	3	4

Credit Balance, £10/0/4.

EXPENDITURE.

	£	s.	d.
By Petty Cash	5	0	0
„ Insurance		3	0
„ Balance at Bank	10	0	4
	£15	3	4

The Queensland Naturalist.

JOURNAL OF THE QUEENSLAND NATURALISTS' CLUB AND NATURE-LOVERS' LEAGUE.

VOL. VII. JULY, 1929. No. 2

PROCEEDINGS.

EVENING MEETING, 18th MARCH, 1929.—The President (Dr. F. W. Whitehouse) occupied the chair, thirty-three members and visitors being present. Mrs. Rickard, Mrs. E. M. Robinson, Miss E. Bumstead, Miss A. Smith, Mr. H. E. Young, and M. W. W. Young were elected ordinary members of the Club. Miss M. C. Trundle and Mr. W. Titmarsh, Junr., were elected to country membership. Reports on the excursion to Nudgee were given by Dr. E. O. Marks (geology), Mr. G. H. Barker (birds), and Mr. C. T. White (plants). A brief account of a few interesting plants recently found in the neighbourhood of Brisbane, mostly on excursions of the Club, was given by Mr. C. T. White (Government Botanist). A suggestion to increase the usefulness of the library by the addition of books both of the popular type and purely reference works was brought forward by Mrs. Aubrey Thomson. Dr. E. O. Marks proposed, and Mr. G. H. Barker seconded a motion that a request be made to members for donations of books or cash. Mrs. Aubrey Thomson, Miss N. Wegner (Hon. Librarian), and Miss E. E. Baird (Hon. Secretary) were appointed a Library Sub-Committee.

EVENING MEETING, 15th APRIL, 1929.—The Vice-President (Mrs. Aubrey Thomson) occupied the chair. Mr. A. Brimblecombe was elected a member of the Club. Mr. J. E. Young (Excursion Secretary) reported that owing to wet weather and the state of the roads it was found impossible to carry out the excursion to Stanley Gorge, but mentioned that some of the party managed to get as far as Reedy Creek by automobile. A few notes were given by Mr. Young on the birds, by Dr. E. O. Marks on the birds, and by Dr. D. A. Herbert and Mrs. Aubrey Thomson on the plants observed.

A lecturette on "Plant Movement," illustrated by experiments, was given by Dr. D. A. Herbert.

A general report on the excursion to the Darra Cement Works and Clay pits (fossiliferous) was given by Dr. E. O. Marks. A report on the fossils found on the excursion was forwarded by Dr. F. W. Whitehouse (see p. 30).

EVENING MEETING, 20th MAY, 1929.—The President (Dr. F. W. Whitehouse) occupied the chair. Dr. E. O. Marks gave a brief report on the excursion to Candle Mountain, and spoke more especially on the physiographical and geological features of the surrounding country (see p. 27). A lecturette on the "Microscopic Structure of Wood" was delivered by Mr. W. D. Francis. The lecturer who has paid a good deal of attention to the anatomy of Queensland woods illustrated his remarks by lantern slides of photomicrographs of Hoop and Bunya Pines (Araucaria spp.), Kauri Pine (Agathis robusta), Australian White Beech (Gmelina Leichhardtii), Thready-barked Oak (Casuarina inophloia) and several other timbers.

EVENING MEETING, 17th JUNE, 1929.—The President (Dr. F. W. Whitehouse) occupied the chair. Mrs. Aubrey Thomson was elected an ordinary member of the Club. Reports on the excursion to Clear Mountain were given by Mr. G. H. Barker (birds) and Mr. C. T. White (botany). Mr. F. A. Perkins, B.Sc. (Lecturer in Economic Entomology, Queensland University), delivered a lecturette on "Fruit Flies." The lecturer mentioned that about sixty species of Fruit Flies (Trypetidae) had been named from Australia, and a number more certainly remained to be described. Several species are of economic importance in Australia, viz., the common Mediterranean Fruit Fly (Ceratitis capitata), the Queensland Fruit Fly (Chaetodacus Tryoni), the Jarvis Fruit Fly (Chaetodacus Jarvisi), the Banana Fruit Fly (Chaetodacus musae), and the Cucurbit Fruit Fly (Dacus cucumis). The spotted or Island Fruit Fly (Rioxa musae), commonly known as the Boatman, occurs in a number of native and cultivated fruits, but is not a primary pest, as it does not breed in sound fruit, but mostly in fruit already attacked by other flies or already injured in some other way. The lecturer then went on to speak of the life history of Fruit Flies and methods of control. The most efficient control method was the regular picking up and destroying of "stung" fruit. This combined with the use of lure and traps went a long way towards success in combating the ravages of the fly.

ANNUAL REPORT OF THE COUNCIL

Of the Queensland Naturalists' Club for year ended 31st December, 1928.

The Council of the Club has pleasure in submitting the 23rd Annual Report of the work of the Club.

MEETINGS.—Ten Council meetings, ten general monthly meetings, one special meeting, a Wild Flower Show, and nine field excursions were held during the year.

The attendance of members at the general meetings has been good, the average being about thirty. During the year lectures, illustrated in most cases with lantern slides or specimens, were given by Messrs. J. E. Young, D. A. Herbert, C. T. White, B. Dunstan, H. G. Barnard, J. Nebe, and Dr. F. W. Whitehouse. Reports of excursions were given, and specimens of interest shown and commented on by many members at most meetings.

A special meeting was held at the University on Friday, September 7th, when Mr. T. J. Roughley, of the Technological Museum, Sydney, gave an interesting account of the "Life of the Australian Oyster." The excursions during the year included two week-end trips, one to Canungra at Easter, and the other to "Hope Dale," Albert River, during November; full day excursions to Hercules Bank on Labour Day, and to Upper Brookfield on King's Birthday; and Saturday afternoon visits to One Tree Hill, Aspley, Eight-Mile Plains, Belmont, and Enoggera. Attendance at excursions has been good.

The Annual Wild Flower Show was held on September 29th, during the afternoon and evening. The exhibits were very good, and the success of the Show was mainly due to the many friends who sent flowers and other exhibits. Attendance was not quite as large as in former years.

MEMBERSHIP.—Thirteen new members have been enrolled during the year, and seven members have resigned. We regret to report the loss by death of two members, Messrs. S. Hainsworth and W. R. Colledge. The Club membership now stands at 138. Of these twenty-two are unfinancial.

GENERAL.—A meeting of representatives of societies interested, to consider the advisability of suppressing the use of the pea rifle, was called. It was

decided that a deputation should wait on the Minister concerned. An officer of the Department was approached, who said he would advise when a deputation would be heard. This advice has not yet been received.

At the instance of Dr. E. O. Marks, a letter was written to the Mayor, requesting that part of the face of Leichhardt Street Quarry should be left uncovered. The decision of the City Council is still awaited.

LIBRARY.—The Hon. Librarian (Miss N. Wegner) reports that during the year 1928, the Club has received by way of exchange for its magazine, one hundred and eighty-four magazines and papers from the various scientific bodies in Queensland and other States of Australia, Great Britain, America, and other parts of the world.

Most of these magazines and papers are purely scientific, while others were devoted more to illustrated articles of general interest.

At the monthly meeting of the Club, the latest publications to hand were placed upon the table for the perusal of the members, and if required, the members would borrow them for a short period. Those taken out by members during last year (1928) amounted to 102.

"QUEENSLAND NATURALIST."—The Hon. Editor (Mr. C. T. White) reports that three numbers of the "Queensland Naturalist" were issued during the year.

J. E. YOUNG,
President
(Miss) E. E. BAIRD,
Hon. Secretary.

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ANNUAL REPORT OF THE NATURE LOVERS' LEAGUE SUB-COMMITTEE

For Year Ending 31st December, 1928.

The sub-committee appointed by the Council of the Queensland Naturalists' Club to further the work of the Nature Lovers' League, for the year 1928, have the honour to submit their report.

Under the chairmanship of Mr. D. A. Herbert, quarterly meetings of the League were held at the Herbarium, Botanic Gardens.

LECTURES AT T.T.C.—The weekly lecturettes to the student teachers of the Training College, dealing with different branches of natural history, were con-

tinued from April to October, by Messrs. C. T. White, D. A. Herbert, G. H. Barker, and Dr. F. W. Whitehouse. The principal of the Training College, in expressing appreciation of the weekly lectures, stressed the interest of the students in the subjects, and the helpful nature of the lectures given.

HON. RANGERS.—Early in the year the Department of Agriculture and Stock advised your sub-committee that six members of the Royal Queensland Yacht Club had received appointment as Hon. Rangers for Queensland Sanctuaries, enabling them to deal with any violation of the Moreton Bay ond other Sanctuaries. The Department has also promised your Council that the group of islands at the river mouth, and known as Fisherman's Islands, will shortly be proclaimed a Sanctuary; as the fresh water lagoons on those islands make them a favourite breeding place for wild fowl.

In August, 1928, the sub-committee sent a circular letter to the City, Municipal, Town and Shire Councils, and Dingo Boards of Queensland, seeking information regarding the number of native bears observed in the various districts since the closing of the open season in September, 1927. The fear that the open season would mean the extinction of the bear was based on the facts that its numbers have already dwindled greatly with the advance of settlement, and that it is a slow breeder. No statistics were available to support the contentions of the deputation organised by the Queensland Naturalists' Club, which waited on the Acting Premier before the season was opened, and efforts to prevent its opening were unsuccessful. It was decided therefore by the committee of the Nature Lovers' League to collect information as to the effects of the open season on the bear throughout the State, and if these warranted further action, to lay the figures before the Minister for Agriculture with a request for permanent total protection. Accordingly, the circulars were sent out by the League in August, 1928. Sufficient time had then elapsed for the effects of the open season to have been noticed. One hundred and two replies were received. Some of the districts, particularly the urban areas, and some northern shires, whose territory consists mainly of rain forest, had no native bears, even before the season opened. The following is a summary of the replies received:—

Bear plentiful.	
Not in favour of protection	1
In favour of protection	2
Bear very scarce, or practically exterminated	69
No bears seen since open season	2
No information as to number of bears, but protection favoured.	7
No bears in district.	
Protection favoured	6
No opinion expressed	15
Total	102

The only local body not in favour of protection of the native bear (omitting those 15 Shire and Town Councils, which, having no data in their areas, expressed no opinion) was the Belyando Shire Council (Clermont). Of those favouring protection, most stipulated permanent total protection, but several suggested definite periods. The figures are as follow:—

In favour of no protection	1
Not in favour of opening next year	1
In favour of 5 years' protection	2
In favour of 10 years' protection	3
In favour of 10—15 years' protection	1
In favour of permanent total protection	79
No opinion because of no data	15
Total	102

These figures are being presented to the Minister for Agriculture, and an article presenting the case in fuller detail is being prepared for the "Queensland Naturalist."

BIRD PICTURES FOR SCHOOL.—In the course of the year your sub-committee acquired a number of the late Sylvester Diggles' water colour drawings of Queensland birds (suitable as object lessons for a nature study class), and presented them to the Leichhardt Street Training School.

APPLICATION FOR SANCTUARY.—During June, an application came to your League from Messrs. Colyer, of Lowmead, for assistance towards making their property a Sanctuary. The matter was placed before the Department concerned, and in August a notification was received from the Department of Agriculture that the matter had been finalised, and the property declared a Sanctuary.

The Director of the Museum has very kindly forwarded applications for N.L.L. Certificates to your sub-committee—mostly received by him from country schools, and in every case the certificates were forwarded at once.

All minor matters of correspondence from kindred Societies and school teachers were dealt with by the Hon. Secretary during the year, and £1/3/9 has been received from the sale of N.L.L. Certificates.

D. A. HERBERT,
Chairman.

(Mrs.) W. M. MAYO,
Hon. Secretary.

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EXCURSION TO CANDLE MOUNTAIN, MAY 4th—6th, 1929. Geological Notes.

(By Dr. E. O. Marks.)

Unfortunately the shortness of our visit was really only sufficient to show what an interesting centre Candle Mountain is for the geologist, and how profitably a considerable time could be spent exploring the vicinity.

The name mountain is rather flattering, as its summit is about 500 feet above the Stanley River, which is itself about 500 feet above the sea level. From the Guest House on the summit an exceptionally beautiful and interesting panorama is obtained. At a distance of two or three miles (and a considerably greater elevation) the northern half of the panorama is formed by the Blackall Range in the steep southern slopes of which rise the Stanley and its eastern branch, Ewen Creek.

To the east, across the low ridge at Peachester and the lower coast country beyond it, one sees Caloundra, Bribie Passage and Island, with the waters of the Bay and Moreton Island sandhills gleaming in the distance. To the south-east the Glass House Mountains, with Beerwah dwarfing the rest of the group, form the chief feature in the landscape. To the south and south-west, fifteen or twenty miles away, the flat-topped Mt. Mee is seen across the intervening wide plain of the Stanley Valley leading down to Woodford. Over the top of Mount Mee

show some of the higher summits of the D'Aguilar Range. From Peachester south to Mt. Mee we see the low divide (having a steep fall on its eastern side), which separates the Stanley waters from the various creeks running eastwards directly into the sea. Situated right on this divide is the largest and westernmost of the Glass Houses, Mt. Beerwah.

The Stanley River, rising in the southern slopes and foothills of the Blackall Range, runs about E.S.E. to Peachester, as if making for the sea by the shortest and most convenient route. At Peachester, however, when less than a mile from the low divide (of soft sandstones), separating it from the lower coast country, the stream suddenly makes a hairpin bend and turns right away from the coast, proceeding via Woodford and Kilcoy to join the Upper Brisbane in a journey of some 180 miles to the sea instead of the ten or fifteen miles had it continued in the original direction. Much of the present long course is through hard rocks, and the sides of the gorge which it has cut through Mt. Brisbane are of greater elevation than the low saddle of soft rock which the Stanley appears to avoid at Peachester.

A sudden change in the direction of a stream is a feature beloved of physiographers, as showing a capture by one stream of the headwaters of another, diverting the latter into a new direction. Such an explanation in the present case is untenable, for it would be impossible for a stream with 180 miles to travel to the sea largely over hard rocks to cut down its bed more quickly than, and to capture the headwaters of another stream with only 15 miles to travel over very soft and easily eroded rocks.

On top of the Blackall Range immediately to the north, Obi Obi Creek takes a similar course to join the Mary River, and a study of it may yield a clue to the anomalous course of the Stanley, which must have been developed when the country was at a higher level than Little Mount Brisbane, which forms the lower side of the gorge.

Basalt forms the top of the Blackall Range. The very top of Candle Mountain is also basalt, probably a small remnant of the same lava flow. Except for this small capping, Candle Mountain is composed of sandstone, as is the country eastward to Caloundra. Near the basalt cap a few waterworn pebbles of trachyte are included in

the sandstone. Rhyolite has been recorded as underlying in places the basalt of the Blackall Range, and the Glass Houses are trachyte. In geological age these have been generally accepted as belonging to the Tertiary period, though without definite proof. Of late years observations have been multiplied of Mesozoic volcanic rocks in other localities. At Caloundra numerous trachytic pebbles occur in the sandstone which is of Mesozoic, probably "Bundamba" age. There seems some possibility that eventually the Glass Houses will prove to be of Mesozoic age also. Further field observations are required, which members of this Club might bear in mind when in the district.

In the Stanley at the junction with Ewen Creek the stones are mostly basalt, with an odd piece of granite, showing that the westward limit of the sandstone does not extend to the very head of the river. On the Kilcoy railway near D'Aguilar, a very large fault determines the boundary of the sandstone and granite, and it would be very interesting to know whether this faulted junction extends as far as the Blackall Range, or if not, the nature of the contact.

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ADDITIONS TO THE LIBRARY.

Since the announcement made at the March meeting regarding the library (see p. 21), the sub-committee appointed report having received a cash donation of ten shillings, and copies of the following works:—Confessions of a Beachcomber (Banfield), My Tropic Isle (Banfield), Plant Life and its Romance (Weiss), Shell Life (Step), Wild Animals of Australia (Lucas and Le Souef), Through a Land of Promise (Terry), Men of the Old Stone Age (Osborn), Science of the Sea (Allen), Timbers and Forest Products of Queensland (Swain), Pests and Diseases of Queensland Fruits and Vegetables (Veitch and Simmonds), The Platypus (Burrell), A Naturalist in Nicaragua (Belt), Birds (Thomson), Modern Study of Plants (Stopes), and Bush Days (Amy Mack).

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NOTES ON THE FOSSILS FOUND ON THE EXCURSION TO DARRA, 13th APRIL, 1929.

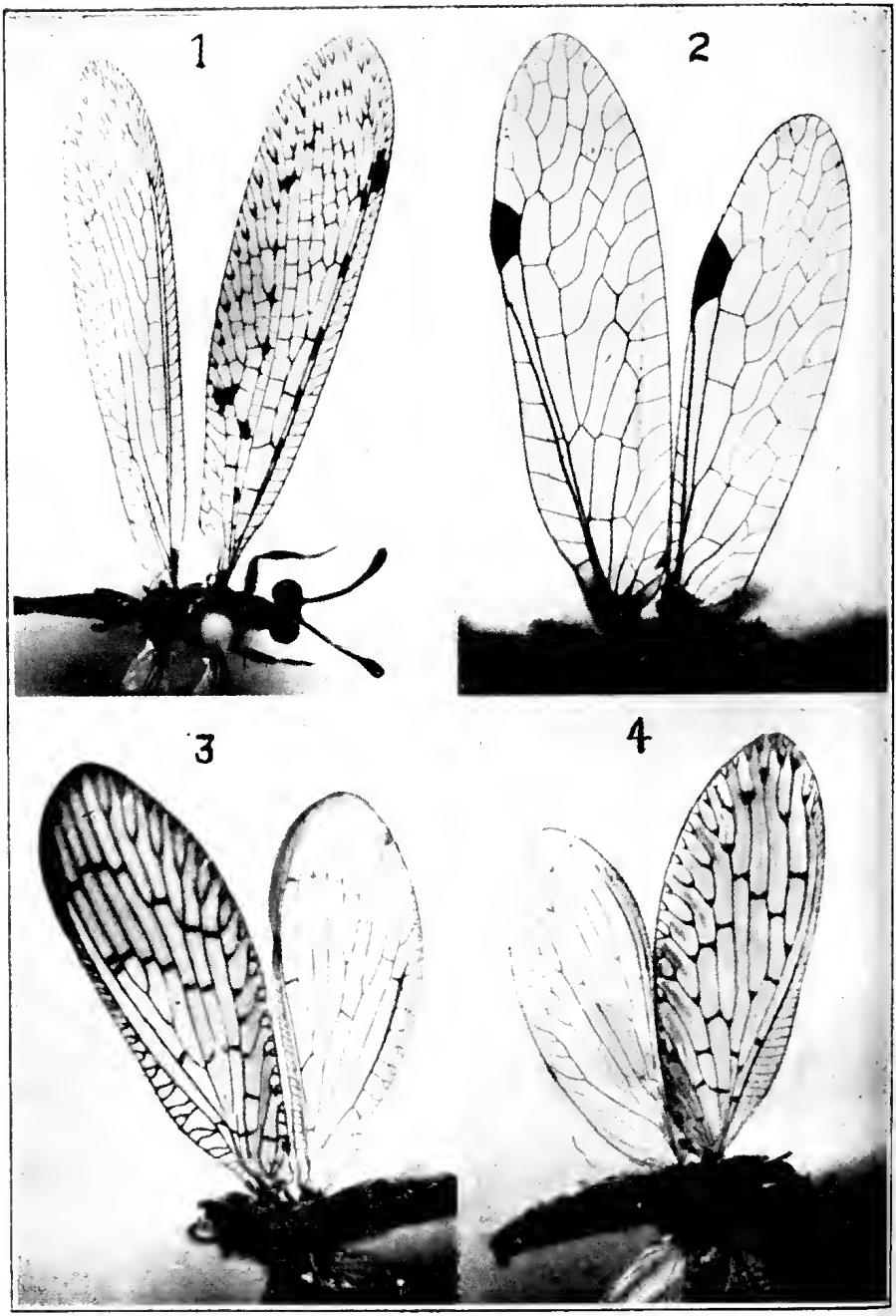
(By Dr. F. W. Whitehouse.)

The party visited the main pit of the Queensland Cement Co., where shaly clays of Tertiary age are well exposed. The beds form part of a considerable extent of tertiary deposits which were laid down in a lake, or series of lakes, occupying depression in the Lower Mesozoic Coal Measures of the Brisbane-Ipswich district. These Tertiary beds in the Ipswich and Redbank Plains district have been divided into a lower Series (the Redbank Plains Series) and an Upper or Silkstone Series. These two series are separated from one another by flows of basalt. The sediments are mainly sands, clays, and shales, with some freshwater limestones in the Silkstone Series. The Darra beds probably belong to the lower or Redbank Plains Series.

Fossils are abundant in many areas. The remains of fish, turtles, insects, and both univalved and bivalved molluscs have been found, as well as a wealth of fossil plants, mainly in the form of impressions of dicotyledonous leaves. No systematic work has been done on any of these groups except the insects in which group Dr. Tillyard has recognised three species. Until much more work has been carried out it is impossible to place the beds in their proper position with the Tertiary period.

On this occasion at Darra a large number of fossil plants and shells were obtained. The shells were all of fresh water bivalves probably belonging to the genus Unio or some similar form. Most of the plants collected consisted of impressions of dicotyledenous leaves; but one or two fragments were obtained which are probably the remains of ferns. The latter differed in their preservation from the dicotyledenous leaves, in that they occurred as carbonaceous films and not merely as impressions. The whole assemblage is very similar to that found in the beds exposed at Hurworth's Quarry on the main road at Oxley.

Specimens of the Darra fossils as well as fish and other forms from the Tertiary beds of other areas, are exhibited.



Australian Neuroptera.

1. Franzenia irrorata.
2. Theristriella stigma.
3. Neurorthus brunneipennis
4. Zachobiella submarginata.

AUSTRALIAN NEUROPTERA. VI.*

(By P. Esben-Petersen, Silkeborg.)

Amongst a lot of very interesting material of Australian Neuroptera, collected by Mr. L. Franzen, Brisbane, I have found some new and undescribed genera and species. It has given me very much pleasure to work out the material, and I express here my most sincere thanks to Mr. L. Franzen for the opportunity to examine these interesting Neuropterous insects.

The following genera and species are described:—

Franzenia irrorata, n.g. and n.sp.—Myrmeleontidae.
Zachobiella submarginata, n.sp.—Hemerobiidae.
Neurorthus brunneipennis, n.sp.—Sisyridae.
Theristriella stigma, n.g. and n.sp.—Mantispidae.

Franzenia n.g.

Antennae rather long, stout and strongly clubbed. Prothorax longer than broad. Legs of moderate length; femora, tibia and tarsus of fore and intermediate legs of equal length; tibiae of intermediate legs strongly and conspicuously broadened. No spurs. Fore and hindwings nearly equal as to length and shape. In the forewing R arises close to the base of the wing and a little before the fork of Cu1. Basal free part of Cu2 rather long; Cu2 somewhat sinuate, and its apical tip curved upward and connected to Cu1p. 2A and 3A running free of each other, but connected to each other by two cross veins. No Banksian line present, and no cross veins in the apical areas of the wings. In the hindwing one cross vein before origin of R.

Genotype: **Franzenia irrorata.**

This new genus has to be placed in the Dendroleontini. The best and most peculiar generic character is the broadened tibia of the intermediate legs.

I take the liberty to name the interesting genus in honour of Mr. L. Franzen, who has done so much in exploring the Neuropterous fauna of Australia.

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*Nos. 1—4 have appeared in the "Proceedings of the Linnean Society of N.S. Wales"; No. 5 in "Queensland Naturalist," vol. vi., pp. 11 and 12.

Franzenia irrorata, n.sp. (Plate III., fig. 1.)

Face and palpi yellow; apical joint of labial palpi with a brown spot exteriorly. A blackish brown transverse band below the antennae. Vertex blackish with a narrow greyish white transverse band a little above the antennae. Antennae blackish with narrow pale joinings; basal joint stout and yellowish; second joint yellowish below, brown above. Prothorax narrowing toward front margin, brownish black with a rather broad pale longitudinal median band, which is almost disappearing toward the hind margin; at each side of the median band a longitudinal streak, reaching from the transverse furrow to the hind margin. Meso and metathorax brownish black with a few indistinct pale spots; mesothorax with strong black bristles on its front part. Abdomen blackish and

Franzenia irrorrata.

Tibia and tarsus of intermediate legs.

with pale pleurae; each segment with a narrow yellowish hind margin, and with a small yellow median spot at front margin; this spot is divided by a fine black streak. Legs whitish with black bands, spots and streaks, and with long black and white bristles.

Venations of wings whitish with numerous short or longer black streaks. Forewings with many brownish black spots; in the subcostal area five or six dark streaks, placed in front of five or six dark streaks on R. All the veins with long white or black hairs. The male with a "pelote" at base of hind wing.

Forewing 18mm, hindwing 17mm, body 17mm. Two specimens at Brisbane, 2/1/1927 (L. Franzen leg.).

The type specimen in the collection of Mr. L. Franzen, the other in the collection of the author.

Zachobiella submarginata n.sp. (Plate III., fig. 4.)

Head yellowish-white; below each eye and along the lateral margin of clypeus a shining brownish-black streak. Palpi blackish, antennae yellowish - white. Prothorax twice as broad as long, above whitish, and with broad, blackish - brown lateral margins. Meso and metathorax whitish, with a brownish spot above base of each wing. Abdomen pale (body somewhat discoloured). Legs whitish; intermediate and hind tibiae spindle-shaped. Head, thorax and legs with long pale hairs. Membrane of wings hyaline; that of forewings with a faint pale yellowish tinge, and with a row of small streak-shaped pale greyish inconspicuous clouds between the forks along hind margin. The longitudinal veins of forewings yellowish, but all the forks and cross veins, except those of costal area, blackish. Venation of hindwing whitish with the exception of the single discal cross vein and a few forks in apical area, which are blackish. The posterior margin of hindwing is dark for a very short distance near its middle. Pterostigma of both pairs of wings hardly visible. Jugal lobe of forewing very conspicuous.

Forewing 5.5 mm, hindwing 5 mm.

One female (type specimen), Tambourine Mt., 5/2/1928 (L. Franzen leg.), one female (type), and one male are kept in the collection of L. Franzen; one male in the collection of the author.

Zachobiella submarginata is the first known species from Australia of that genus. In 1920 N. Banks founded the genus (Bull. Mus. Comp. Zool. Cambr. 335) for the species punctata Banks (ibid. 335, pl: III., fig. 36. 1920) from the Philippines. Later on the author described jacobsoni (Entom. Mitt. 406, fig. 4. 926) from Sumatra, and L. Navas described marmorata (Mem. Pont. Accad. Sc. Nuovi Lincei, vol. IX., Roma, 118, fig. 6, 1926) from the same island. Zachobiella submarginata is nearest allied to Zachobiella punctata Bks.

Neurorthus brunneipennis n.sp. (Plate III., fig. 3).

Head and thorax reddish yellow. Antennae and palpi yellowish. Abdomen brown above, yellow below; fourth, fifth, and sixth segment with pale yellowish spots or

streaks laterally. Legs yellowish white. Antennae, head, thorax, abdomen and legs strongly haired. Membrane of wings hyaline; that of forewings yellowish tinged; but the apical margin narrowly brownish shaded. Venation of wings brownish yellow; all the cross veins brown; those of the disc of forewings dark brown and narrowly shaded.

Forewing 8 mm, hindwing 7 mm.

Eight specimens, Tamborine Mt., 5/11/1928 (L. Franzen leg.).

Type specimen in the collection of Mr. L. Franzen; other specimens in the author's collection.

Of the genus Neurorthus Costa (Nuovi stud. Ent. Calabr. Ult. 32, 1863) two European and two Japanese species are known. The Japanese species, punctatus Nak. and fuscinervis Nak., differ from the European, fallax Ramb. and iridipennis Costa, by the presence of some forked cross veins in the costal area of the forewings. In that respect the Australian species is nearest allied to the Japanese.

Theristriella n.g.

Fore tarsus with two claws. Prothorax closed below. M forks almost just below origin of Rs. its stem rather long and straight as in Theristria. In the forewing M 1 and 2. is connected to R5 by a short cross vein; in the hindwing this crossvein touches the stem of M. Cu forks regularly as in Theristria. In the forewing 1A and 3A is unforked; 2A forked. Costal area of forewing rather broad. The pterostigma very short but very broad, opaque. When the wing is held against the light trace of one or two cross veins are visible in the pterostigmatical area. Few branches from R5.

Genotype: Theristriella stigma n.sp.

This new genus is allied to Theristria Gerst. and Calomantispa Banks, and the three genera may be separated in the following way:—

1. Wings long and rather slender. In the forewing the stem of M is straight and does not coalesce with R5. 1A in the forewing unforked. Forewings without coloured markings. 2.

Wings short and broad. In the forewings the stem of M is curved, and it coalesces for a distance with the basal part of Rs. 1A in the forewing forked. Forewings with coloured markings. Calomantispa.

2. Pterostigma of moderate width, but several times longer than broad, and with inconspicuous cross veins. Many branches from Rs. Theristria.

Pterostigma very broad, hardly twice as long as broad. Few branches from R5. Theristriella n.g.

In "Broteria," pag. 27, 1927, Navas has described an Australian genus Veura, which is a synonym of Theristria Gerst. In "Proc. Linn. Soc. N.S. Wales," 594, 1923, I gave a notice of, that Theristria felina Gerst. was the same as Theristria delicatula Westw. All the generic characters given by Navas for Veura agree exactly with those of Theristria. But it is, unfortunately, what Navas does, to use the numbers of branches from Rs as a generic or specific character, because the numbers of those veins are liable to vary in a high degree. In my collection I possess five specimens of Th. delicatula, and the numbers of branches from 1st, 2nd and 3rd radial cell are respectively: 1st specimen, right forewng 1, 3, 4; right hindwing 1, 3, 4; left forewing 1, 3, 4; left hindwing 1, 3, 4. Second specimen (the branches counted in the same order): 1, 3, 2; 1, 3, 2; 1, 2, 2; 1, 2, 3. Third specimen: 1, 2, 3; 1, 3, 3;; 1, 3, 2; 1, 2, 3. Fourth specimen: 1, 3, 4; 2, 2, 4; 1, 3, 3; 1, 3, 3. Fifth specimen: 1, 2, 3; 1, 3, 3; 1, 2, 4; 1, 3, 4. I suppose that Veura debetazi Navas (Broteria, pag. 28, fig. 31, 1927) is a specimen of Th. delicatula Westw. with somewhat differing markings of the head.

Theristriella stigma n.sp. (Plate III., fig. 2.)

Face yellowish; the central part of labrum and clypeus occupied by an indistinct pale brown spot. From the brown vertex downward three narrow blackish streaks. Vertex with two yellowish brown spots. Antennae slender; the two basal joints brownish yellow; the second joint with a darker ring; the rest of antennae black. Prothorax about three times as long as broad in front; dark brown with a pale indistinct median streak; granulated and with short dark hairs; finely transversely suleated in its apical part; prothorax tubercles indistinct. Hind margin of prothorax blackish. Meso and metathorax blackish with an irregular pale median streak. Abdomen discoloured. Legs greyish white; femorae mostly brown. Venation of wings dark brown; pterostigma reddish brown; basal part of wings yellowish tinged.

Forewing 10 mm, hindwing 9 mm.

One female specimen, Southport, 50 miles from Brisbane, 2/10/1927 (L. Franzen leg.)

The type specimen in the collection of Mr. L. Franzen.

THE EUCALYPTUS OR GUM TREES OF THE BRISBANE DISTRICT.

(By C. T. White, Government Botanist.)

VIII.

(Continued from the "Queensland Naturalist," Vol. 6, p. 82.)

14. Eucalyptus acmenioides (Yellow Stringybark).

Description.—A large tree (or in poor siliceous soil sometimes little more than a shrub) with a rough fibrous bark, the fibres rather short and prickly to the touch; dark reddish brown, but the outermost layer mostly bleached a dark grey and commonly much blackened by fire; ultimate branchlets smooth. Young branchlets angular but soon become terete. Coppice leaves or leaves on young trees opposite, ovate-lanceolate to less commonly ovate, base auriculate, oblique, apex long and acuminate, dull green above, markedly paler, inclined to be glaucous beneath, 3—4½ inches long, ½—1½ inches wide, varying a good deal in proportion of length to breadth, in the more lanceolate leaves five times as long as broad, in more ovate ones only two and a half times as long as broad; veins and veinlets fine, clearly discernible on the under surface, less plain above; the main nerves fine (mostly about ½ inch apart), intramarginal vein in the narrower leaves very close to the edge, in the wider ones further (up to one line) away. Ordinary (secondary or adult) leaves coriaceous, lanceolate, usually falcate, paler on the under than on the upper surface (usually clearly discernible even in the dried specimens), base cuneate, acuminate at the apex and mostly gradually drawn out to a long point; petiole ¼—½ inch long; blade up to 6 inches long and 1 inch wide, 5—7 times longer than broad, midrib distinct on both surfaces, lateral nerves arising from the midrib at an angle of about 45deg., mostly clearly visible on the under surface, usually indistinct on the upper, ¼—½ inch apart, intramarginal vein very close to the edge, almost touching in the narrower leaves, about one-sixth of an inch removed in the wider ones. Flowers in umbels in the upper leaf axils, the terminal ones forming short leafless panicles: umbels 12—15 flowered; peduncle rather slender, about ½ inch long; calyx tube turbinate, narrowed at the base into a distinct pedicel, calyx and pedicel together ¼ inch long; operculum, conical 2 lines high; stamens in several series, all perfect, the longest filaments about 2 lines long; sta-

Eucalyptus acmenioides
(Yellow Stringy Bark).
Chermside, near Brisbane.

[Photo, C. T. White.

Eucalyptus acmenioides var. carnea

(Yellow Stringy Bark).
Gundiah, S.E. Queensland.

[Photo. C. T. White.

mens small kidney-shaped, opening inwards in two wide slits. Seed capsule sub-globose, truncate at the top, about ¼ inch in diameter, on a slender pedicel of two lines; mostly 4 (rarely 3 or 5) celled; rim very narrow, valves included.

Distribution.—Eastern Australia from the Port Jackson district in New South Wales to the Wide Bay district in south-eastern Queensland. It has been recorded considerably north of this range, but I think most of these belong to the var. carnea. About Brisbane the trees occur mostly on the Brisbane schists. It does not seem to occur above 70 miles inland.

Common Names.—"Yellow Stringybark" is the vernacular in most common use in Queensland. In New South Wales "White Mahogany" seems the name in most general use.

Botanical Name.—Eucalyptus (see under No. 1) acmenioides from acmena, a genus of plants now included under Eugenia, and Greek eidos, resemblance.

Timber.—The timber is cut and sold by Queensland mills as a general hardwood.

Botanical Reference.—Eucalyptus acmenioides J. G. Schauer in Walper's repertorium botanices systematicae II. 924 (1843).

15. Eucalyptus acmenioides var. carnea (Yellow Stringybark).

Description.—A large tree with the bark characters of E. acmenioides, except that the ultimate branchlets are less inclined to be smooth. Young branchlets angular but soon becoming trete. Coppice leaves or leaves on young shoots ovate rotund to ovate-lanceolate, at first auriculate at the base, opposite and sessile, but soon becoming petiolate and later alternate, a gradual transition from coppice to adult leaf being traceable, blade at first membranous but soon thick and coriaceous, up to 7 inches long and 3 inches wide, in the broader leaves not much longer than broad, in the narrower leaves about 2½ times as long as broad, paler beneath but not markedly so as in E. acmenioides; veins and veinlets clearly discernible, the main nerves rather far (mostly about ½ inch) apart, intramarginal vein one-eighth to one-quarter inch from the edge. Ordinary (secondary or adult) leaves, thick-coriaceous, ovate-lanceolate to lanceolate, base cuneate usually, but not always, very oblique; apex gradually drawn out to a long point; petiole ¼—½ inch long; blade up to 7 inches long and 1½ inches wide, varying consider-

ably in proportion of length to breadth, being 3—7 times as long as broad; midrib distinct on both surfaces, but lateral nerves usually hardly discernible, especially in those leaves of a thicker texture. Flowers in umbels in the leaf axils or on the older wood from which the leaves have fallen, the uppermost ones sometimes forming small terminal panicles: peduncles, pedicels, calyx tube, operculum, etc., as in E. acmenioides, the flowers being the same except that perhaps usually they are a little more robust. Seed capsule broadly turbinate or more rarely subglobose, 3—5 lines diam., 3—5 (mostly 4) celled, rim narrow, valves included or flush with the top.

Distribution.—The type came from North-eastern New South Wales, but Maiden in his "Critical Revision of the Genus Eucalyptus" I., 267, records it as far south as Broken Bay, at the mouth of the Hawkesbury River. It is the common form in Queensland, and extends from the New South Wales border to the Cairns timber district, and occurs in a variety of formations. It does not seem to occur more than about 70 miles inland.

Common Names.—"Yellow Stringybark" in Queensland, and "White Mahogany" in New South Wales; not generally distinguished by timber getters, etc., from E. acmenioides.

Botanical Name.—Eucalyptus (see under No. 1) acmenioides (see under No. 14), carnea, Latin, fleshy, referring to the thick leaves.

Timber:—Cut and sold in Queensland mills as a general hardwood.

Botanical References.—E. acmenioides Schauer var. carnea (Baker) Maiden in "A Critical Revision of the Genus Eucalyptus" I. 267. E. carnea R. T. Baker, in Proceedings Linnean Society N.S.W., Vol. XXXI., p. 303 (1906).

16. Eucalyptus umbra (Yellow Stringbark).

Description.—A medium sized tree with a rough fibrous bark, inner bark dark reddish brown, but the outermost layer usually bleached a dark grey, and commonly more or less blackened by fire; like E. acmenioides var. carnea, the fibrous bark is persistent almost to the topmost branches. Young branchlets angular but soon becoming terete, the angularity very marked on the young coppice shoots; these latter are also often deep vinous purple. Coppice leaves or leaves of young trees at first often sub-opposite and sessile, but soon becoming alternate and petiolate and merging into the adult form; blade at first membraneous, but soon becoming thicker and rather

Eucalyptus umbra
(Yellow Stringy Bark).
Mount Gravatt, near Brisbane.
[Photo, C. T. White.

coriaceous (intermediate in texture between E. acmenioides and E. acmenioides var. carnea), paler beneath than above (in this respect also between E. acmenioides and E. acmenioides var. carnea), ovate to ovate-lanceolate, variable in size (again intermediate in this respect between E. acmenioides and E. acmenioides var. carnea), up to 7 inches long and 2 inches broad, very variable in relation of length to breadth, in some leaves scarcely twice as long as broad, in others slightly more than four times as long as broad, in the longer leaves tapering at the apex into a long slender point; veins and veinlets clearly discernible on the lower surface, not so easily seen on the upper, main nerves mostly about ½ inch apart, intramarginal vein from almost touching to 1½ lines removed from the edge of the leaf. Ordinary (secondary or adult) leaves thick-coriaceous, ovate-lanceolate to lanceolate, straight or falcate, base cuneate, oblique equal sided, apex acuminate sometimes drawn out into a long point, petiole ½—¾ inch long; blade 3—5 inches long and ¾—1¼ inch broad; midrib distinct but secondary veins obscure due to the thick leathery nature of the leaf. Flowers in umbels in the leaf-axils, the uppermost ones often forming small terminal panicles; peduncles pedicels, calyx tube, operculum, etc., as in E. acmenioides, but considerably coarser. Seed capsule broadly turbinate 4—5 lines diameter, 3—5 celled, rim well marked and fairly broad, straight or more or less slanting (domed), valves exserted or flush with the top.

Distribution.—The type came from the Port Jackson district, New South Wales. In Queensland it is sparsely distributed here and there along the coast from Brisbane to Keppel Bay (Byfield). About Brisbane it occurs in very dry sandstone country in the neighbourhood of Mt. Gravatt and in dry siliceous schist at Chermside.

Common Names.—"Yellow Stringybark," comparatively rare in Queensland, and not generally distinguished by timber-getters, etc., from E. acmenioides and E. acmenioides var. carnea.

Botanical Name.—Eucalyptus (see under No. 1); umbra, Latin meaning shady.

Timber.—Not plentiful enough to be cut to any extent, though where it grows it is cut by local residents for fencing, etc.

Botanical Reference.—Eucalyptus umbra, R. T. Baker, in "The Proceedings of the Linnean Society of New South Wales," Vol. XXV., p. 687, p. 1 XLIV., 1901.

RETIREMENT OF Mr. HENRY TRYON.

Mr. Henry Tryon, one of the founders of this Club, and who still takes an active interest in its work, and who, since he retired from the position of Chief Government Entomologist and Vegetable Pathologist, in December, 1925, has been carrying on, for the Government, special entomological and vegetable pathological work, was the guest of honour at a large valedictory gathering at the Department of Agriculture and Stock on the occasion of his final retirement from the State Service on 30th June, 1929.

The Under Secretary for Agriculture and Stock (Mr. E. Graham), who presided, said that the function had been arranged for the purpose of bidding an official farewell to Mr. Tryon, who had been associated with the public service of the State for nearly half a century. As a result of his work Queensland had greatly benefited, particularly in respect to the great primary industries of the State. His work had been extensive, and he had been responsible for much of the important pioneering work of Australia in his chosen scientific field.

His services to the sugar industry particularly had been of immense value. As a result of a visit paid by him to New Guinea on a Government mission in 1896, new varieties of cane had been introduced into Queensland, including the variety known as Badila, which had proved of vast economic advantage to Queensland sugar growers. Mr. Tryon's record was a splendid one of service to the State, and his fellow officers of the Department had a high appreciation of his work and worth.

Messrs. F. F. Coleman and C. T. White cordially supported Mr. Graham's remarks.

Mr. Graham then handed to Mr. Tryon a wallet of bank notes, as a token of the high esteem in which he is held by the officers of the department.

Mr. White presented Mr. Tryon with an additional token, this being from the officers of the department in the Stanthorpe area, and consisting of a silver calendar.

Mr. Tryon, in reply, thanked his fellow officers most heartily for meeting to wish him god-speed on the occasion of his severing his official associations with them. He appealed to them all to give of their best for the State, and be untiring in their efforts to help their country.

The Queensland Naturalist.

JOURNAL OF THE QUEENSLAND NATURALISTS' CLUB AND NATURE-LOVERS' LEAGUE.

VOL. VII. OCTOBER, 1929. No. 3

PROCEEDINGS.

SPECIAL MEETING, WEDNESDAY, 18th JULY, 1929.—The valuable scientific work which the Barrier Reef expedition has been doing was explained by Dr. T. A. Stevenson in an address on "Life on Low Island," which he delivered to a largely-attended meeting of the Club. The president (Dr. F. W. Whitehouse) presided, and Dr. Elizabeth Fraser, who also is a member of the expedition, was present.

Dr. Stevenson, by demonstrating that he was a skilled artist as well as a noted scientist, made the address extremely interesting. With the assistance of a blackboard he prefaced his remarks by giving a vivid idea of the shape and formation of Low Island, and then proceeded to trace the growth of the coral from the egg to the adult stage. Illustrating the difficulties encountered when testing the weight and size of the coral at different stages, he said measurement was a serious obstacle. Calculations were assisted by photographs periodically taken, and the experiments were conducted by placing pieces of coral on cement blocks, and keeping them under water. Valuable scientific information had been gained by these means. Opportunity had been taken to make a map of Low Island and complete a survey, based on a study of the life and habits of the animals which inhabited it. Dr. Stevenson referred to the wonderful picture to be seen in the vicinity of Lizard Island, to which he had paid a brief visit, owing to the structure and colouring of the reefs. Generally speaking, coral was rather dull in colour, but it was rendered extremely beautiful owing to the texture which gave it a nice effect under water. There were, however, species of bright colours of a wide range. Replying to a number of questions, Dr. Stevenson was optimistic regarding the results which could accrue from the investigations of the expedition.

Mr. H. A. Longman (deputy chairman of the Great Barrier Reef Committee) moved a vote of thanks to the lecturer.

Professor E. J. Goddard, D.Sc., seconding the motion, which was carried with acclamation, said that they were proud of the fact that Britishers were taking such a prominent part in the study of what undoubtedly was a great national asset to Australia.

EVENING MEETING, MONDAY, 15th JULY, 1929. —The president (Dr. F. W. Whitehouse) occupied the chair, and about 30 members were present. Mrs. D. Noad and Messrs. J. H. Stevens, F. Radcliffe, and the Rev. W. R. Reece were elected members of the Club. Reports on the excursion to the hills in the neighbourhood of Mt. Gravatt were given by Mr. C. T. White (Botany), Mr. G. H. Barker (Birds), and Mr. L. Franzen (Insects). Dr. W. H. Bryan, of the Queensland University, gave an interesting and instructive lecture on the modern aspect of the study of soils (see p. 44). Mr. G. H. Barker reported that a committe appointed by the Club had waited upon the Premier (Hon. A. E. Moore), and had been assured by him that the use of lights and cyanide by trappers, and the killing of native bears was absolutely forbidden and all offenders caught would be prosecuted.

EVENING MEETING, MONDAY, 19th AUGUST, 1929.—In the absence of the president, Mr. G. H. Barker occupied the chair. Mr. Frank Kunze was elected an ordinary members of the Club. Dr. T. G. H. Jones, of the Queensland University, gave an address on the Essential Oils of the Australian Eucalyptus. The eucalypts number about 300 species, and represent probably the most important genus of hardwood trees in the world. On this account they have been largely planted in all parts of the world where there is a chance of their succeeding. Apart from their value as timber trees, an important industry connected with the genus is the distillation of the leaves for eucalyptus oil. Eucalyptus oils for pharmaceutical purposes should have a high cineol content, though this rule is very arbitrary, for it is not at all certain that cineol is the most important germicidal constituent in the oil. Unfortunately, a very few of the Queensland species possess a cineol content equal to that demanded by the British and United States pharmacopaeas. On the other hand, some of the Queensland species are noted on account of the citron-scented nature of the oils. The most notable being Eucalyptus citriodora, the citron-scented Spotted Gum, fairly common in Queensland from the Burrum River northwards. Another

important constituent of eucalyptus is phellandrene and oils containing large quantities of this are now distilled for use in the separation of minerals by the flotation process, in the manufaeture of disinfeetants, etc. The lecture was illustrated by a number of specimens of eucalyptus oils mostly distilled at the Teehnological Museum, Sydney.

WILD FLOWER SHOW AND NATURAL HISTORY EXHIBITION.

Saturday Afternoon and Evening, 7th September, 1929.

There was a very fine display of wild flowers from various parts of Queensland and representative collections from the other States. In the latter conneetion donations were reeeived from Western Australia (Miss E. Arnold and Colonel B. T. Goadby), Adelaide (Mr. E. H. Ising, on behalf of the Field Naturalists' Club of South Australia, and Mr. J. F. Bailey, Director, Botanie Gardens, Adelaide), Vietoria (Mr. J. W. Audas, Curator of the National Herbarium, on behalf of the Field Naturalists' Club of Vietoria). Queensland flowers eame from the Granite Belt (Mesdames Gittens and Slaughter), South Coast, Bilinga (Mesdames Nicholson and Baird), Burleigh Heads (Mrs. Meyers), Southport (Mrs. Saltmarshe and Miss M. Birt), Springbrook (Mr. W. Rudder), Albert River (Mrs. S. E. and Mr. D. Curtis), Tamborine Mt. (Mrs. H. Curtis and children of North Tamborine School), Amity Point (Mr. T. and Miss H. Welsby), Kingston (Miss Bumstead), Rochedale (Mesdames Comrie Smith and Thomson), Sunnybank (Mr. C. T. White), The Blunder (Messrs. Densil Curtis, J. Nebe, and W. W. Young), Bribie Island (Mrs. Comgeau), North Coast (Mrs. A. Thomson and Miss B. Murphy, Messrs. Lanee Perry-Keene, and J. Smith). Sprays of Geraldton Wax Flower (Chamaelaueium) grown in Brisbane, were shown by Mrs. Hammond and Mr. J. C. Brunnieh, and a splendid exhibit of Western Australian Wattle (Aeacia saligna), grown at the Sherwood Arboretum, Brisbane, was tabled by Mr. E. W. Biek. A cone of Macrozamia Denisonii and a wonderful series of photographs of the growing plants were shown by Mr. and Mrs. Herbert Curtis, of Tamborine Mt. Shells were exhibited by Mr. J. H. Simmonds; coral from the Barrier Reef by Miss Bardsley; moths by Mr. D. Curtis, and from the collection of the late Mr. Rowland Illidge. The competition for flowers arranged for deeorative effect was superintended by Mrs. Aubrey Thomson and attraeted ten entrants. The

judge, Mrs. Ewart, decided that the entries should be divided into three classes: (1) vases, (2) small bowls, (3) large bowls. First and second awards were made in each class. First places were allotted to Mr. F. Robinson, Mr. D. Curtis, and Miss Grimes; seconds to Mrs. S. E. Curtis, Mrs. Comrie-Smith, and Miss Welsby. This innovation was a great success, and attracted a lot of admiration from those present. The State School Competition had seven entries: Booyal, Bidwell, Yandina, and Caloundra from the North Coast; Thulimbah, from Granite Belt; Russell Island and Mount Tamborine, from South Coast; Lagoon Pocket entry did not arrive in time. These were judged by Mr. C. T. White and Dr. D. A. Herbert; Yandina, Thulimbah, and Russell Island being placed first in their respective districts. Prizes in this competition were donated by Mr. G. H. Barker. Photographs of wild flowers and natural history subjects were shown by Mrs. H. Curtis, Messrs. R. L. Higgins, F. Robinson, C. Dornbusch, and others. The exhibition was one of the most successful yet held, and it is estimated that nearly a thousand people visited the show during the afternoon and evening.

THE MODERN ASPECT OF THE STUDY OF SOILS.

By W. H. Bryan, D.Sc.

(Department of Geology, Queensland University.)

The study of soils is the youngest of the sciences and the oldest of the applied sciences.

Ever since man first deserted his nomadic hunting life and settled on the land he has been interested in soils from the point of view of their productivity. As a result of the trials and errors of thousands of years he has built up an uncertain knowledge of the soil based on empirical laws. Even from the specially selected point of view of productivity the knowledge thus gained by experience is far from complete, as witness the many disastrous attempts at soldier settlements in this and other countries.

It is only since the beginning of the present century that a definite attempt has been made to treat the study of soils as a science. This new science has been given a new name—"Pedology." The pedologist does not concern himself directly with the economic aspect of soils, but with their genesis and evolution. He studies the processes which are in operation in soils, the factors producing those processes, and the end products of those processes.

Geologists have for many years shown a desultory interest in the relationship of soils to their parent rocks. Consequently the Pedologist has inherited a small store of facts of observation and some rather crude ideas with regard to soil processes.

The new science of Pedology was established early in this century by a group of Russian scientists, chief of whom was Glinka. The huge extent of the Russian provinces, embracing as they do a varied assortment of geological, geographical, and climatic conditions which were yet found in one continuous land mass, formed an excellent field for the study of the origin and formation of soils.

The methods of the Russian pedologists have now been adopted by the United States of America. It is because their methods are eminently suitable for our own wide land of Australia that I have had the temerity to introduce the subject to you this evening, for I am not a pedologist—I am a geologist.

Soils can be roughly divided into two great groups. The first group includes all those which have been carried to the position which they now occupy through the agency of wind, ice, or running water, and which therefore bear no relationship to the underlying rock floor. These are known as soils of transportation. They include great areas of valuable alluvial soil, and are often of great importance from the economic point of view, but they are of little help to the pedologist. The other great group is made up of soils formed in situ, and which are therefore directly related to the underlying rocks, although they may be very dissimilar from them. These may be called the sedentary soils, and it is with this group that I wish to deal particularly.

The nature of these sedentary or residual soils must in the early stages of their formation be largely controlled by the nature of the underlying parent rock, but it is the principal thesis of modern pedologists that it is climate which is ultimately the dominating factor, and that in the end when the soil has reached equilibrium with its environment it may not resemble even remotely the rock from which it has been formed.

Those sedentary soils which have not yet attained equilibrium with the local climatic conditions, but still show to a greater or less extent the influence of the parent rock, are known as "Immature Soils," while those which have reached stability under the existing climatic conditions are called "Mature Soils."

The most immature soils are sometimes called skeletal soils, for they are merely the disintegrated portions of the underlying rock. Between such Skeletal Soils and those mature soils which represent a perfect equilibrium with the climate there are a host of soils of many kinds, some of which still retain the mineralogical characters of their respective rocks, while others already show signs of the more important influence wielded by climate.

The preponderance of the climatic over the geological factor is well seen if one compares a geological map of Europe with a soil map of Europe. The two have not the slightest resemblance. The geological map looks like a patchwork quilt, the soil map appears as several broad bands roughly parallel and concentric with the north pole and coinciding almost exactly with well-marked climatic regions.

But, although theoretically any soil should ultimately reach equilibrium with its environment, provided it remains in place for a sufficient length of time, there are practically many factors which influence and may retard or even inhibit the production of a mature soil.

Thus temperature has marked effects upon the chemical changes involved in the production of soil so that maturity would be arrived at more quickly in tropical than in temperate regions. And the same may be said of rainfall. Topography, too, would play an important part for, except in those climates of very rapid soil changes, the soils of mountainous and hilly country would be washed away long before equilibrium with the environment could be attained. Another important factor is the chemical relationship between the original rock and the particular soil which should exist to satisfy the climatic conditions. Thus a soil rich in iron and alumina would be formed more readily from a ferruginous shale than from a quartzose sandstone. A ferruginous clay in a tropical lowland of high rainfall would seem to be an ideal combination of conditions for the rapid formation of a mature soil, but if even one of the factors (1) Rock composition, (2) Temperature, (3) Rainfall, (4) Topography, chances to be unfavourable the production of a mature soil might be an extremely slow process.

In spite of the many exceptions that these considerations will entail, the two following rules appear to be the only logical conclusions, viz.:

1. That under any one set of climatic conditions all rocks **tend** to produce the same soil type.

2. That the same rock under different climatic conditions will produce quite different soil types.

As an example of the first rule, let us consider the famous Black Earth or Tschernozem which constitutes the great wheat-growing area of Russia and south-eastern Europe. In this belt the climatic conditions are well marked and the topographic conditions uniform. The soil is of wonderful uniformity over very large areas, and is of a uniform thickness and texture notwithstanding the fact that the underlying rocks may be Loess, Cretaceous, Chalk, Jurassic Clays, or weathered granite.

The second generalisation is well illustrated by granites. Under different climatic conditions similar granites give rise to ferruginous laterites in the wet tropics, to ashy podzols in the cold temperate region, and to black earths on the dry warm temperate plains.

Let us consider briefly the processes at work in the transportation of a granite into (1) a Skeletal Soil, (2) a Laterite, and (3) a Podzol.

In the first case the hard compact rock is disintegrated largely as the result of purely physical actions such as the differential expansion of the constituent minerals as the result of heating of the rock surface by day and cooling by night. These physical processes may be and often are assisted by chemical processes which, while they did not bring about any important mineralogical changes in the rock, render it nevertheless more susceptible to the disintegrating physical processes. In the end a soil is produced which is made up of the same minerals as the parent rock in much the same proportions. Such a soil is remarkably rich in plant foods, for all the original potash, lime, and phosphorus of the rock itself are still present in the soil. Hence there comes about the interesting fact that desert soils, which are often skeletal soils, on account of the great predominance of the processes of physical disintegration over those of chemical decomposition, are among the most fertile in the world. If water can be brought to such soils either by irrigation or other means, they are wonderfully prolific. The world famous orchards of California illustrate these conditions.

In the second case, conditions are very different. There is some difference of opinion as to the climatic conditions under which laterites are formed, but the majority verdict at the present time favours tropical conditions where the temperature is always high and where there is a heavy rainfall through much of the year, a state of affairs which Glinka describes as optimum moisture

conditions. Under these circumstances, owing to the very rapid bacterial decomposition of the organic matter very little humus will be present in the soil. The silicates which form a large part of the granite will be decomposed, and the potash, soda, and lime leached out in the form of carbonates or bicarbonates. These alkaline carbonates in their turn dissolve the silica, which is removed as silicic acid, so that all that is left of the original rock are the oxides of iron and aluminium. This explains why many of the aluminium and iron ore deposits of the world are superficial accumulations associated with laterites.

An interesting point which is frequently not realised is that these tropical laterites are very poor soils from the agricultural point of view. In spite of the heavy cover of vegetation, the humus content is slight. They are very low in lime and acid in reaction. They are deficient in potash and phosphates. Their only redeeming feature is their coarsely granular structure. In the third case where a granite yields as its soil a typical podzol, both the soil processes and results are quite different.

Podzols are soils developed under average moisture conditions, and occur in cold or temperate humid climates, They are grey ashy soils, and are found beneath the greater part of the coniferous forests or North Ameriea and Northern Europe and Asia. The climate is wet and cool with long winters and comparatively short summers.

Like the laterites they are developed under a forest cover, but although the rainfall is less this is more than compensated by the smaller evaporation. Hence the soil conditions are actually moister. Thus aeration of the humus layer is poor, and decomposition relatively slow and of an anaerobic character, with the result that the humus is acid in reaction. Hence the descending waters are also acid, so that, unlike the case of the laterites, it is the iron and aluminium oxides that are removed while the silicic acid remains behind. There is thus formed the white or greyish ashy horizon which gives the podzols their name. Above lies a dark layer formed by the raw humus, and below the bleached horizon is a brownish layer where the iron and aluminium oxides, together with a good deal of humus is thrown out of solution either in the form of a continuous story layer or pan or as an aggregation of small concretionary bodies. The organic matter thus exists **under** the bleached zone, almost as though the soil profile had been turned upside down.

Although so different in many respects, there are two features which the laterites and podzols have in

common, namely an acid reaction and a deficiency in lime. These two features seem to be characteristic of all soil processes formed under humid conditions whatever the rainfall.

Let us briefly consider the nature of the soils formed under conditions of light to intermediate rainfall. Here the characteristic features are lack of acidity and the presence of lime in the soil, often in the shape of concretions which are restricted to a well-defined horizon. The soils formed under these conditions are for the most part wonderfully good. It is interesting to note that where conditions of rainfall are ideal for plant growth, the intrinsic value of the soil is poor, and that where the rainfall is light the richest soils are produced.

The best known and most characteristic soils of the latter group are the famous tschernozems or black earth. These occur in the belts of relatively intermediate climate that separate the semi-arid from the humid lands in both the middle and low latitudes. They are what Glinka terms soils of scanty or moderate moistening. The rain is sufficient for the development of a rich growth of grass in the spring and early summer. Summer drought succeeds and the soil conditions are so dry that bacterial decomposition of plant residues is hindered by lack of moisture. For this reason humus accumulates in considerable quantities. That part of the humus which is oxidised completely supplied abundant carbonic acid, which in its turn forms carbonates, especially lime carbonate. This is deposited as a discontinuous layer in the soil, the drier the climate the more nearly this layer approaches the surface. This accumulation of lime occurs regardless of the character of the parent rock.

It may be truthfully said that not much has been accomplished by these methods beyond the description of numerous soil profiles and the interpretation of the various soil processes in terms of chemical reactions, but I am of opinion that in the end the pedologists will arrive at the goal before the empiricists in spite of the "short cuts" of applied science and the fact that they have had a start of several thousand years.

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FUNGI FROM DUNK ISLAND, NORTH QUEENSLAND.

By Miss Maud M. Duke, Royal Botanic Gardens, Kew, England.

[During a visit of students of Biology of the Queensland University to Dunk Island in August, 1927, one of

the party (Mr. W. Cottrell-Dormer) made a collection of the larger fungi. Mr. Dormer handed the collection over to me, and I forwarded a set to the Royal Botanic Gardens, Kew, for determination; as several proved new records for Queensland, the list of all the material is given herewith, those representing new records for the State being indicated.—C. T. WHITE.]

Cloeporus conchoides **Mont.** (No. 45). New record for Queensland.
Favolus spathulatus **(Jungh) Bres.** No. 41). New record for Queensland.
Fomes senex **Mont**, resupinate form. (No. 8.)
Fomes setulosus **Lloyd.** (Nos. 36 and 37). New record for Queensland.
Hexagonia rigida **Berk.** (No. 35)
Hexagonia Thwaitesii **Berk.** (No. 34). New record for Queensland.
Hirneola polytricha **(Mont.) Saac.** (No. 16).
Lentinus Hookerianus **(Berk.)** (No. 27). New record for Queensland.
Lenzites aspera **Kl.** (No. 31). New record for Queensland.
Polyporus anebus **Berk.** (No. 1).
Polyporus durus **Jungh.** (Nos. 3 and 29). New record for Queensland.
Polporus flabelliformis **Kl.** (No. 22.) New record for Queensland.
Polyporus gilvus **(Schw.) Fr.** (No. 6).
Polyporus hemicapnodes **Berk and Br.** (No. 32). New record for Queensland.
Polyporus rubidus **Berk.** (Nos. 4 and 28).
Polystictus cinnabarinus **Fr.** (No. 17).
Polystictus flabelliformis **Kl.** (No. 23).
Polystictus lilacina-gilvus **Berk.** (No. 13).
Polystictus Peradeniae **Berk and Br.** (No. 44).
Polystictus Persoonii **Fr.** (Nos. 10, 33, and 42).
Polystictus pinsitus **Fr.** (No. 39).
Polystictus xanthopus **Fr.** (Nos. 24 and 25).
Schizophyllum commune **Fr.** (No. 19).
Stereum lamellatum **(Berk. and Curt.) Cooke.** (No. 26).
Stereum percome **Berk. and Br.** (Nos. 30 and 43). New record for Queensland.
Trametes cingulata **Berk.** (Nos. 2 and 7). New records for Queensland.
Trametes lactinea **Berk.** (No. 5).
Xylaria allantoidea **Berk.** (No. 9).
Xylaria anisopleura **Mont.** (No. 20).

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REVIEW.

"The Orchids of Victoria," by E. E. Pescott, F.L.S., F.R.H.S., Melbourne, Robertson and Mullens, 92pp., 1 cold plate and numerous photographic illustrations. Price 6/-.

One of the surest methods of increasing interest in Australian natural history subjects is the publication of

text-books, strictly accurate in details, though presented in language understandable by persons of ordinary education, or with a limited knowledge of the terminology of the particular subject dealt with.

A work of the above description is "The Orchids of Victoria," by Mr. E. E. Pescott, the well-known Victorian botanist and horticulturist. For many years past the author has paid special attention to the orchids of Victoria, and in the above work has now given students of botany in that State the benefit of his many years' study.

A very noticeable difference between the orchids of this State (Queensland) and those of Victoria is, whereas in the former the epiphytic species number approximately the same (about 100 of each kind), in the latter, out of the total 118 species in the State, half a dozen species at the outside could be termed epiphytic.

Though dealing definitely with the orchids of Victoria, many—in fact the great majority—spread beyond that State, and many species, common at least to all the Eastern States, are described. The book reviewed is one that can be recommended to all botanists and lovers of Australian wild flowers.

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THE PLANT ECOLOGY OF PALM ISLAND, NORTH QUEENSLAND.

(By Dr. D. A. Herbert, Department of Biology, University of Queensland.)

The Palm Isles, consisting of eleven islands and a number of rocks and reefs, lie off the North Queensland coast opposite Halifax Bay. A partially submerged mountain range extends from Pelorus or North Palm Island on the north, through Orpheus and Fantome, reappearing a few miles south in Falcon and Brisk Islands. To the east of Falcon lies Eclipse Island, and to the west Esk Island and Dido Rock. The backbone ranges of Eclipse and Esk are parallel to that of Falcon, and the general trend is continued in Fly and Havannah Islands to the south. To the east of this chain runs a second range represented by the islands known as Curacoa and Great Palm. The main range of this latter runs south-east for about four miles, then turns to the south-west, reaching its highest point at Mount Bentley (1818 feet). From the bend a branch range runs out to the south-east as the backbone of a large peninsula. The westwardly directed branch branches again at Mount Bentley, the northerly spur end-

ing in a hill of 927 feet, the southerly branch with one peak of 1283 feet, forming the backbone of a cape. Great Palm Island is thus a roughly triangular island with mountain ranges radiating in three directions from a point somewhat east of its centre, a branch from one of these ranges dividing the western segment. Enclosed in the horseshoe so formed is a broad sandy alluvial plain. Elsewhere the ranges run down to the sea, fringed here and there with narrow sandy flats. The range of the south-western cape is interrupted by a narrow strip of sandy plain which extends from the southern end of Challenger Bay to the south coast of the Island.

Historical.

On June 7th, 1770, Captain Cook, in the "Endeavour," passed the group on the west. From the deck of the boat the vegetation so resembled coconut trees that Lieut. Hicks was sent ashore with two small boats to investigate. With him went Sir Joseph Banks and Dr. Daniel Solander. The party returned shortly and reported that they had found nothing but cabbage-tree palms. (These were screw pines; no cabbage-tree palms (Livistona spp.) occur on the islands.) The "Endeavour" was lying about half a mile from the shore, and the boats left at 4 p.m., returning at dusk—about 5 p.m. There was therefore little time for collecting, but Banks and Solander managed to obtain a few specimens. As is to be expected, these were species which are found growing close to the shore line. They were: Pittosporum ferrugineum; Hibiscus radiatus; Halimum portulacastrum (Sesuvium portulacastrum); Knoxia stricta (K. corymbosa); Pterocaulon glandulosus; Sarcostemma australe; and Siphonanthus floribundus (Clerondendron floribundum). On their return to England plates were prepared of these and other specimens of the voyage, but it was not until 1900 that they were published.

From the appearance of the vegetation from the ship the group received its name of Palm Isles. Cook charted the western coast as far as he was able, and on his chart the eastern coast is marked as a dotted line. It appears from his chart that the landing was not made on Great Palm Island, but at the south-west corner of Orpheus, which is some miles to the north-west.

A local version of the origin of the name "Palm Island" is that Cook landed there on Palm Sunday. This, of course, is disposed of by the entry and explanation in the log, and by the fact that June 7th was long after

Palm Sunday. The coconut palms comparatively recently planted along the coast of Great Palm Island, and scattered plants and groves of Archontophoenix Alexandrae on the mountains are the only true palms on the islands in any considerable number, except the lawyer vines.

Round settlements a few ornamental species, particularly Phoenix canariensis, are now cultivated.

The Formations.

The islands of the Palm Group are continental, and their flora is similar to that of the mainland. Oceanic islands depend on transmarine immigration and, consequently, have a poorly developed flora. Masthead Island, one of the Capricorn Group, is one example. Its flora has been described by Longman, who records a total of twenty-six species there. Of these only four—Euphorbia eremophila, Ficus opposita, Pandanus peduncularis, and Castanospermum australe—are endemic to Australia. The last named was represented by one fruit only.

The same factors of marine, avian, and aeolian transportation which operate in the phytoecolonization of a cay operate in the case of a continental island, and it is to be expected therefore that on them will be found the same species as occur on oceanic islands in the same general region. Such is the case, and colonists of coral islands such as Tournefortea argentea, Scaevola Koenigii, Boerhaavia diffusa, Ipomoea pes-caprae, Casuarina equisetifolia, and Canavalia obtusifolia, are common along the shores of Great Palm Island. The flora is, however, mainly of the type found under similar conditions on the adjacent mainland. The rocks of the area are granites similar to those of the Townsville area. Aplite and pegmatite veins are common, and dykes of less acidic rock are occasionally met with. These latter, however, are not of sufficient size to cause any modification of the flora.

As Great Palm Island is approached from the western side from the sea the bands of dark Malayan vegetation running down the mountain side are very suggestive of a local development on a dyke, particularly as the same bands are found on the smaller islands, and in the case of the strip on Eclipse Island, appear continuous. These bands do not correspond with any alteration in the composition of the rock, but are confined to the gullies where moisture conditions are more suitable to mesophytic or hydrophytic vegetation. Eclipse Island, which is only 206 feet at its highest point, is wind-swept, and the trees

on the exposed parts are very stunted. The prevailing winds are from the south, and the southern slopes of the gullies are too dessicated for the development of Malayan forest. Accordingly we find the slopes facing the south tenanted by the more xerophytic grasses and Eucalypts, while the sheltered northern slopes support a forest of Malayan type. Great Palm Island, by reason of its higher mountain chain, is more protected, except on its southern side, and Malayan forest clothes both sides of depressions. This extends up the mountains and at a height of about a thousand feet the gully forest broadens out, occupying the ridges as well. The conditions of moisture on the ridges above this altitude are more favourable than they are below, apparently owing to the presence of a cloud belt on dull days. The lower and drier ridges cannot support this type of vegetation, and its place is taken by the Eucalyptus forest, a delicate balance existing between the two. The Malayan forest is not swept by bush fires, though it suffers from their effects along its margins. The more open Eucalyptus forest with its dry undergrowth is fired regularly, and as a result is in many places greatly modified, the herbs and small shrubs being destroyed and their places taken by various light-loving grasses such as Heteropogon contortus, and Stipa semibarbata. On level country the open Eucalyptus forest gives place to a savannah type, and finally to grassland, though this is not common. Swampy land on this level country gives rise to a special type of formation in which the associes are Melaleuca leucadendron and Phragmites communis. In other cases rather similar country with brackish water supports Melaleuca leucadendron as its only tree, while various ferns (Acrostichum aurem, Lygodium scandens, Blechnum serrulatum, and Pteris ensiformis) form the carpet. Along the shore a characteristic strand flora composed in the main of species found throughout the eastern tropics in similar positions is found. This flora is above high tide mark, though a few of its species invade the mangroves. Mangrove forests skirt the shore where mud is deposited between high and low tides, and occur along the tidal creeks.

The formations on Great Palm Island may be treated under the following heads:—

1. Eucalyptus forest.
2. Malayan forest—
   (a) monsoon forest;
   (b) rain forest.
3. Grassland.

4. Swamps—
   (a) freshwater;
   (b) brackish.
5. Strand vegetation.
6. Mangrove forests.

Eucalyptus Forest.

The eucalyptus forest on Palm Island is characteristic of the ridges and drier parts of the island, such as sandy flats. The dominant species of this formation are four species of Eucalyptus—E. terminalis (Bloodwood); E. alba (Cabbage Gum); E. tessellaris (Moreton Bay Ash); and E. tereticornis (Blue Gum); and one Albizzia, A. procera. A number of other trees are also met with but are never dominant. These are—Cochlospermum Gillivraei (a Kapok tree); Acacia flaveseens; Acacia holosericea; A. polystachaga; Homalanthus populifolius; Macaranga tanarius; Pleiogynium solandri; Brassaia actinophylla; and, more rarely, Randia Fitzalani. Between the trees are small shrubs and herbs, but where fires have swept the hills these give way to tall grasses. The shrubs and small trees include Myoporum acuminatum; Tephrosia astragaloides; Melastoma malabathricum; Indigofera pratensis; Crotalaria linifolia; Crotalaria calyeina; Crotalaria Mitchellii; Desmodium biarticulatum; Abroma fastuosa; Abutilon muticum; A. auritum; Hibiscus radiatus; H. manihot; H. normani; and H. tiliaceus. The herbaceous covering is varied—Anthistiria imberbis (Kangaroo Grass); Heteropogon contortus; Panicum traehyraehis (eoolibar grass); and Stipa semibarbata (an awn grass)—are the dominant Gramineae, and after bush fires when the canopy has been removed, the ombrophobous Heteropogon grows breast high and so thick as to make walking through it extremely difficult. Here and there in this grass thicket Panieum traehyrachis may be distinguished by its loose graceful panicles, and Stipa semibarbata frequently is dominant, or the only species over considerable areas. Before burning over, however, these grasses are not dominant in the herbaceous eovering, though they form an important part of the general pieture. With them are assoeiated Cheilanthes tenuifolia (rock fern); Polypodium phymatodes; Halorrhagis acanthocarpa; Pterocaulon glandulosum; Sphaeranthus mireocephalus; Dianella laevis; Helichrysum elatum; H. bractaetum; H. elatum; and Geodorum pictum.

Climbers are represented by Lygodium seandens; L. reticulatum; L. japonicum; Passifora foetida; and

Eustrephus latifolius. Epiphytes are rare in the Eucalyptus forest. An orchid—Dendrobium undulatum—common along the coast, growing over rocks and trees, ascends into this formation, but is more commonly met with in the monsoon forest. Dendrobium teretifolium, the pencil orchid, is also occasionally seen. Brassaia actinophylla (the umbrella tree), usually a small terrestrial tree in the monsoon forest or the Eucalyptus forest, was observed in one instance, growing in the hollow of a broken branch of Bloodwood (Eucalyptus terminalis), eighteen feet from the ground. It had a stem eighteen feet long with twelve branches each surrounded by the typical umbrella top of leaves—about five to each branch in this case. The roots were well developed with an abundance of root hairs, and were feeding on the abundance of humus in the pipe. There was no sign of attempted parasitism, though the the bloodwood branch had healed over and held the umbrella tree firmly with its callus.

The general composition of the Eucalyptus forest is not uniform. It is influenced considerably by physiographical factors, and the same may be said to be true of the Malayan forest. The vegetation of open forest of the flats may be regarded as a transition from the strand to the Eucalyptus formation. It has associated with the dominant Eucalypts such strand types as Pandanus, Melaleuca leucadendron (which is also, of course, a swamp type), and Homalanthus populifolius. Pandanus and Melaleuca disappear on the higher slopes. The composition of the forest on the slopes varies with the exposure. Slopes facing the north and east are populated almost exclusively with dark, rough-barked bloodwoods Southern, western, and south-western slopes have all four species of Eucalyptus, and the white trunks of E. terminalis, E. tessellaris, and E. alba give this part of the forest a quite distinctive appearance. Albizzia proeera does not greatly affect the general composition of the forest, but its pinnate leaves and beautiful shape make it one of the most noticeable trees of the formation. Frequently it is attacked by Loranthus longiflorus; the Eucalypts, though often infested by this parasite, being more generally attacked by L. pendulus.

(To be continued.)

The Queensland Naturalist.

JOURNAL OF THE QUEENSLAND NATURALISTS' CLUB AND NATURE-LOVERS' LEAGUE.

VOL. ~~VIII~~. APRIL, 1930. ~~No. I~~

Vol VII No IV

PROCEEDINGS.

EVENING MEETING, Monday, 21st October, 1929. —The President (Dr. F. W. Whitehouse) occupied the chair, and about 40 members were present. An invitation was received from Mrs. Curtis, senr., to spend a week-end at Hopedale, Upper Albert River. It was decided to accept Mrs. Curtis's invitation, and to arrange a week-end excursion during November.

A report of the Wild Flower Show and Natural History Exhibition was read, showing that after all expenses had been paid the exhibition showed a credit balance of £38/0/2. A motion of thanks to the Hon. Secretary (Miss E. E. Baird) was unanimously carried. Formal Notice of Motion regarding alteration to the rules was given by Dr. D. A. Herbert. Addition and alteration in the rules:—

It was desired to add the words: "And receiving the 'Queensland Naturalist'" to Rule 12, so that the rule should read: "All Societies in Queensland having similar aims are eligible for affiliation with this club. All credited members and affiliated societies or clubs whilst resident in Brisbane shall be entitled to participate in the privileges of the Club, the right of voting and receiving the privileges of the Club only excepted. Branches of the Club may be formed in centres other than Brisbane, provided that a sufficient number of members are enrolled. The subscription shall be 10/- per annum, of which 5/- shall be paid to the parent Club for the privileges, including receipt of 'The Queensland Naturalist' of country members' trip.

Reports on the excursion to Sandgate were given by Messrs. J. O'Neil Brenan and H. G. Barnard (birds), and Dr. E. O. Marks and Dr. F. W. Whitehouse (geology). Mr. Brenan also spoke on the birds seen at the Aspley excursion in September. Mr. G. H. Barker gave a popular lecture, illustrated with lantern slides, on "Our Birds." Exhibits tabled at the meeting included (1) a cus cus (Phalanger maculatus), a flying fox (Dobsonia magna), and a witchstone, all from New Guinea, by Mr. J. E. Young; (2) bird photographs and eggs, by Mr. Fenton Robinson; (3) a folio of West Australian wild flowers, from Mr. C. Gough, by Mr. G. H. Barker; (4) birds'

nests of last season, by Mrs. Comrie Smith; and (5) a new species of Lingula, by Dr. F. W. Whitehouse.

EVENING MEETING, Monday, 18th NOVEMBER, 1929.—The President (Dr. F. W. Whitehouse) occupied the chair, and 46 members were present. Mr. J. F. Ingram (State School, Bocyal) was elected a country member.

The adoption of the additions and alterations to the rules, as notified the previous month was carried.

Reports of excursion to Draper's Crossing, Pine River, were given by Dr. E. O. Marks (geology), Mr. G. H. Barker (birds), and Mr. J. E. Young (trees and plants). Mr. Barker also spoke on the birds observed at Hopedale, Upper Albert River. It was decided to write and thank Mrs. Curtis, senr., for her hospitality.

Dr. E. O. Marks and Mr. J. E. Young, as delegates of the Club, reported having attended a meeting of persons interested in the preservation of National Parks, and it had been decided to take steps towards the formation of a National Parks Protection League.

A very interesting lecture on X-Rays was delivered by Mr. J. Nebe.

ANNUAL MEETING, MONDAY, 17th FEBRUARY, 1930.—The President (Dr. Whitehouse) occupied the chair, and about 46 members were present.

Miss E. Smith (Toowong) was elected an ordinary member of the Club. The Easter Camp at Amity Point was announced.

Reports.—The honorary secretary read the Twenty-Fourth Annual Report, its adoption being moved by Dr. Whitehouse, seconded by Mr. Young, and carried.

The Report of the Nature Lovers' League was read by the President, its adoption being moved by Mr. White, and carried.

The Librarians' Report, read by Mr. Simmonds, showed that 382 publications were received by exchange, 57 being borrowed by members, and 33 books have been bought or given by members. Its adoption was moved by Mr. J. H. Simmonds, seconded by Mrs. Aubrey Thomson, and carried.

The Financial Statement, duly audited, read by the hon. treasurer (Mr. P. Sylow), showed a credit balance of £47/8/6.

Election of office-bearers for 1930 resulted as set out on the cover page of this issue. The retiring President (Dr. F. W. Whitehouse) gave an interesting address on "The Progress and the Present Needs of Queensland Palaeontology."

The newly-eleeted President(Mr. C. T. White) said a letter had been reeeived from the hon. seeretary of the Great Barrier Reef Committee that the representative of the Club on the Committee (Mr. Henry Tryon) had resigned, and asking for the appointment of another representative. Dr. D. A. Herbert was elected as the Club's representative. Prof. H. C. Richards proposed, and Dr. E. O. Marks seconded a motion to the effect that Mr. Tryon be written to appreeiative of his past service as representative of the Queensland Naturalists' Club on the Great Barrier Reef Committee.

General natural history photographs and an X-ray photograph of the rostral blade of a saw-fish were shown by Mr. J. Nebe.

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ANNUAL REPORT
For Year Ending January 31st, 1930.

Ladies and Gentlemen,

The Council of the Queensland Naturalists' Club has pleasure in submitting the twenty-fourth (24th) Annual Report of the work of the Club:—

OBITUARY.—It is regretted that the death of two members (Mr. W. Gaylard and Mr. H. Henderson) has to be recorded.

MEETINGS.—Ten Council Meetings, nine Monthly Meetings, one Special Meeting, a Wild Flower Show, and eleven Field Exeursions were held during the year.

Attendanee at Council Meetings has been as follows: —Dr. Whitehouse 8, Mrs. Thomson 7, Mr. Barker 9, Miss Baird 10, Mr. Sylow 9, Mr. Young 6, Miss Wegner 1, Mr. Simmonds, senr. 1, Miss Grimes 7, Mr. Smith 7, Mr. Simmonds, M.Se. 5, Dr. Marks 10, Dr. Herbert 8, Mr. Sanderson 6, Mr. White 7.

Mrs. Mayo left the State early in the year, and in Mareh, Miss Grimes was appointed acting hon. secretary of the Nature Lovers' League. Miss Wegner resigned the librarianship, and Mr. J. H. Simmonds, senr., took up this work. Mr. J. E. Young was absent in New Guinea for some months.

The attendanee at the monthly meetings has been good, the average being about 33. During the year, lectures, illustrated in most eases with lantern slides or speeimens, were given by Mr. C. T. White, Dr. D. A. Herbert, Mr. W. D. Francis, Mr. F. A. Perkins, Dr. W. H. Bryan, Dr. T. G. H. Jones, Mr. G. H. Barker, and Mr. J. Nebe. Reports of excursions were given, and

specimens of interest shown and eommented on by many members at the meetings.

A Special Meeting was held on July 10th, when Dr. T. A. Stephenson, of the Barrier Reef Expedition, gave a most interesting leeture on "Life on Low Island," illustrating his remarks by excellent blaekboard sketches.

EXCURSIONS.—The exeursions during the year included two week-end trips—one being to Candle Mt. in May, and the other to Hopedale in November. A whole-day excursion to Clear Mt. on King's Birthday, and Saturday afternoon trips to Sherwood, Forest Park, Nudgee, Darra, Mt. Gravatt, Aspley, Rochdale, Sandgate, and Draper's Crossing. The Easter Exeursion had to be given up owing to wet weather. Reports of excursions were given at the following evening meeting.

WILD FLOWER SHOW.—The Annual Wild Flower Show was held on September 7th during afternoon and evening. The exhibits were exeellent, and the splendid success of the Show was greatly due to the many friends who sent the flowers and other exhibits, as well as te members who helped in arranging them.

MEMBERSHIP.—Nineteen new members have been enrolled during the year, and six members have resigned. Club membership now stands at 141.

"NATURALIST."—Three issues of the "Queensland Naturalist," the official publication of the Club, have been made during the year.

LIBRARY.—The Hon. Librarian (Mr. J. H. Simmonds, senr.) reported that during the past year a total of 382 publications were received by way of exchange (as against 184 for the previous year). Of this total 96 were Australian, 42 British, 44 European, and 200 American. Copies borrowed by members numbered 57 (as against 102 for the previous year). The most popular publieation was the Journal of the American Museum of Natural History, for which 25 applications were made.

Books in the new section of popular scientific literature now number 33. These have been donated by members or purehased by grant from the Club funds. Two autographed copies from the authors are reeorded, viz., "Flowers of Our Bush," by Mrs. Aubrey Thomson, and "Birds and Green Places," by Mr. A. H. Chisholm.

Since the commencement of this seetion in May of last year the books have been taken out by members 57 times, giving ample evidence of their appreeiation of the new arrangement, and also explaining the seeming falling off of interest in regard to the other portions of the Library.

A quantity of literature has been removed from the Library in an endeavour to make room for new books, etc. This has been packed in eight parcels, and left by the kind permission of Mr. G. H. Barker at his Book Store in Ann Street.

Lists giving contents of each parcel are available for reference if required.

NATURE LOVERS' LEAGUE.—The Hon. Secretary of the Nature Lovers' League (Miss I. D. Grimes) reports as follows:—

The sub-committee appointed by the Council of the Queensland Naturalists' Club to further the work of the Nature Lovers' League, for the year 1929, has the honour to submit its report.

Under the chairmanship of Dr. D. A. Herbert, meetings were held at the Herbarium, Botanic Gardens.

The activities of the league this year have been confined to the giving of weekly lectures dealing with different branches of natural history, to the students of the Teachers' Training College. The Principal of the College had again expressed his appreciation of these lectures, so they were given as in former years, from May to October, by Dr. D. A. Herbert, Dr. F. W. Whitehouse, and Messrs. C. T. White and G. H. Barker.

The sale of Nature Lovers' League Certificates was very small compared with that of the year before, only fifteen being asked for. There is still an ample supply of the certificates available for those who want them.

GENERAL.—Owing to representations from this Club, protection that had been given to the iguana was rescinded.

A deputation from the Club obtained a promise from the Premier (Hon. A. E. Moore) that the regulations in regard to 'possum shooting would be strictly enforced.

A request from the Aquarium and Terrarium Society for affiliation was considered, and the necessary alterations made in the rules to allow of the societies having similar aims to affiliate.

The National Parks League invited the co-operation of the Club in matters affecting the welfare of National Parks in Queensland. Attention was drawn to the killing of duck and wallaby on Peel Island, and a sub-committee has been formed to make further inquiries.

F. W. WHITEHOUSE,
President.

(Miss) E. E. BAIRD,
Hon. Secretary.

ROENTGEN OR X-RAYS: THEIR PRODUCTION AND PROPERTIES.

By J. Nebe.

(Delivered before the Queensland Naturalists' Club, 18th November, 1929.)

As I have been requested by several members of the Club to give a lecture on X-Rays, I have much pleasure in doing so, and hope the subject will be of sufficient interest to warrant the taking up of a valuable time this evening.

The subject is a very large one, but I shall be brief in explaining the "Production and Properties of X-Rays." You will excuse me if the subject drifts away somewhat from our regular nature studies, for strictly speaking, X-Rays do not occur free in nature. However, we may consider them as phenomena of nature and treat them as such accordingly.

We will picture in our mind a man, sitting in his hut, again and again exciting a piece of Amber (or as it was then known as "Electron") by rubbing it with a fur and watching it attracting small particles such as pieces of paper and feathers. This man was the Greek philosopher Thales, living in 600 B.C. He studied this phenomenon of nature, and the electrical age was born but it took a long time to develop. It took 2,000 years to advance one step further. It was in the year 1600 when Gilbert, the Englishman, was able to prove that some other substances such as glass sealing wax, and sulphur, became electrified like amber. These he called "electric bodies," and all other bodies were supposed to be "non electric."

From Gilbert's time onward, until Faraday's time, practically nothing further developed, but since then, that is about a hundred years ago, many have been the lovers of Nature that have laboured hard, but with pleasure, to solve problems and extract valuable information from her. One of these workers was Professor Roentgen, who, in the year 1895, is credited with the discovery of a then unknown ray, which he himself could not account for at that time, and called it the X-Ray, meaning the unknown.

The value of this new ray, and its properties (especially in medicine), was soon realised, and to-day it is a comparatively simple matter to produce this ray. The course of the rays and their properties are no more obscured in darkness. The expression of the X is now superceded by the name of Roentgen Ray, in honour of its discoverer.

Briefly, Roentgen Rays are produced by passing a high voltage electric current through a vacuum tube. If an electric discharge takes place in the air it is always accompanied by a sound, the air becoming incandescent owing to the very great resistance to the flow of the current, and naturally it follows that great expansion of the air (which now has become a good conductor) takes place. In a fraction of time the electrical balance is again established and the heated air cools rapidly and causes a partial vacuum. The in-rush of air to fill up the difference in pressure is so sudden that a crackling noise is heard. Thunder, accompanying lightning is an example.

We know that the air offers a great resistance to the flow of electricity; however, if we reduce the atmospheric pressure to 1 c.m. of Mercury, or lower, a silent electric discharge takes place; the glass container which we call a vacuum tube begins to glow from red to violet when excited by a high voltage current. As the pressure is further reduced the tube becomes harder, a thin stream of bluish colours will be noticed between the two metal poles. This is called the Cathode Ray, and is simply a path of conductance. Cathode Rays are not X-Rays, as they can be influenced by magnetic lines of force. The rarified air becomes ionised, and free electrons are bombarded silently at the metal terminals within the tube.

Roentgen Rays originate in any region where the velocity of electrons is suddenly changed. In an X-Ray tube the high speed electrons are stopped in their flight by the interposition of a piece of metal called a target. It is here where the impact of electrons takes effect.

The problem of X-Ray production resolves itself in the separation of electrons from atoms, by giving them high speed and stopping them with sufficient suddenness. It will take too long to explain the ordinary gas tube, its construction and operation. We have several specimen tubes on the table which can be inspected afterwards. The working conditions of a gas tube is always more or less unstable, owing to the continually changing vacuum pressure. When the tube gets softer a greater amount of current will flow, and the voltage of electric pressure drops with a resulting loss in X-Ray penetration. On the other hand, a gas tube may get harder (that is the vacuum is lowered), and practically no current can be put through such a tube, and there is a great risk, if the voltage is increased to overcome the increased resistance, to puncture the tube by a spark and render it useless.

The gas tube is now generally replaced by the electron tube, and all modern X-Ray installations are fitted

up for use of these tubes. This tube has a very high vacuum, and no free moving electrons exist as there are no atoms present. No ionisation in an electron tube can take place, hence also it is not possible to pass an electric current through a complete vacuum. However, it is possible to force electrons across space by heating a so-called filament.

A few short remarks in regard to the modern conception of the electron theory may not be amiss. The atom is to be compared with a solar system, having a main stationary centre, which is the positive portion of the atom. The remainder of the atom, equal in electrical value, is made up of small electric charges named electrons; they are negatively charged, and are able to move freely, and are in no way dependent on the atom from which they come.

It is the electron, the negatively charged particles, that respond to electric forces; wherever an electric current is flowing we have wandering electrons. When a body has a negative charge, then such a body has a surplus of electrons, and vice-versa, a positive charge has a deficiency of electrons. A good conductor of electricity is such where the electrons can move about with great ease, whereas in a bad conductor the movement of electrons is restricted. Heat assists the free movement, as we have noted that when the air becomes incandescent it makes a good conductor.

The Electronic X-Ray tube contains a filament so arranged that it can be heated up by a low voltage electric current. A variation in the strength of this current will also vary the heating effect of the filament wire. In turn more or less electrons are liberated to be driven across to the target when the high voltage current is applied.

It is the electron supply that governs the high-tension current and is practically independent to voltage. Low voltage produces a soft ray, or in other words, a ray that is readily absorbed, and its penetration properties through substance is small. High voltage, however, produces a more penetrating ray. The course of variation in penetration or quality of the ray is the speed at which the electrons are driven from the filament to the anode.

The quality of the ray is of great importance, and is independent to the quantity of current, which is, as before said, dependent on the electrons available at the cathode. The voltage required to produce X-Rays of suitable quality for diagnostic purposes ranges from 40,000 to

100,000. For X-Ray Therapy, and for the examinations of metals in industry, the voltage frequency used is up to 250,000. The current is measured in milli-amperes, and proportional as to time, that is to say, one exposure of ten milli-amperes for 10 seconds, and another exposure of 100 milli-amperes for 1 second are of equal value.

There is no fluctuating gas pressure in the electronic type of tube; it is constant under all conditions of voltage and current, and can be run for hours at a time. The only limit is the limiting temperature that the target and the focal spot thereof can stand. Tungsten metal is generally employed as target material on account of its high melting point. Great heat is developed at the target, and for diagnostic work the construction of the Cathode is such as to focus the electrons on to a small spot on the target; this produces better definition in the radiograph. Care has to be taken so as not to overload the focal spot.

This is a brief outline of the production of the Roentgen Ray. The presenee of the rays must be determined by the effect they produce when acting on material bodies.

We shall now consider the properties of the rays: Their penetration of substances opaque to light; their effect on the photographic film; their ability to eause fluoresceneе; and their ability to affeet the living cell.

Roentgen Rays are not visible. The wave length is very much shorter than the range of the visible spectrum. The wave length is about 1/10,000 part of that of light, but the velocity is the same as light.

X-Rays cannot be reflected or focussed; they travel into and through, and out of material bodies, be such bodies opaque to light or not. This is the penetration effect, and is analagous to light passing through turbid water. The rays gradually get absorbed in the material body with increasing depth.

Penetration and absorption in material bodies is in the same order as the density number of elements. Aluminium has a density of 2.7; copper, 8.9; lead, 11.3; glass, 2.5; pinewood, .5; hardwood, 1.2; water (which is a compound), 1; bone, up to 2; and body tissues, about 1. It is the absorption effect, differing with dissimilar elements, that is of great value in diagnostic work.

The density of bone, whieh is about twice as high as the body tissues, is the effect of varying density of shadows,

as it is noted on the fluorescence screen and also the radiograph. The Ray absorption is greater at the denser elements, and a smaller amount of penetrating ray passes through to expose the film. Glass and aluminium have practically the same density. Glass, although very transparent to light, is just as dense to X-Ray as aluminium.

When a beam of Roentgen Rays falls on an object, part of it is absorbed, part of it is transmitted, and part of it is scattered. The percentage absorbed depends on the wave length or quality of radiation, the thickness of the media, its density and atomic weight. Radiographs are in reality only shadow pictures made possible by the different absorbing effect of the media.

We have seen that part of the ray is transmitted. This transmitted ray becomes further absorbed by the photo film and produces a chemical change. Scattered rays or secondary rays are produced in all absorbing media by internal refraction. As they are radiated in all directions it can readily be seen that a general fog on a radiograph is set up and interferes much with fine detail.

Certain chemicals have a property of absorbing X-Rays and converting their energy into a longer wave length so as to produce ordinary visible light. This property is called fluorescence. Quite a number of substances will produce this effect. Barium Platino-cyanide and Calcium Tungstate (known as white salt) is generally used in the manufacture of X-Ray fluorescence screens. The fine powder of the salt is evenly spread on a piece of cardboard and protected with a lead glass cover, which also protects the operator from the rays when examining an object. Without this protection he would run a risk of an X-Ray burn in the face as he is in direct line of the emerging ray.

X-Ray fluorescence is a greenish light and not too brilliant, consequently screen examination must be carried out in absolute darkness. The property of fluorescence plays another important part, namely:—by reducing the time of X-Ray exposures when taking radiographs. One of such prepared screens is placed on each side of the X-Ray film and directly in contact with it. When an exposure is made, not only the ray itself is acting on the film, but the fluorescence or the light of the screen also acts. By such means the exposure only needs to be 1 5 as long as would otherwise be the case. Not only is there a great saving in apparatus, but less chance

of movement when diagnostic pictures are taken, also less risk to a patient by prolonged exposures to the Ray.

This leads to the final discourse of this lecture, namely:—The X-Ray effect on the living cell. X-Rays, as useful as they are in many ways, are also harmful to the living cell. In the X-Ray we have a powerful destructive agent, and if administered in sufficient quantities will cause death to every living cell. Many X-Ray workers have exposed themselves too frequently, and have suffered, and even died, from the effects of the Ray. Modern plants, as we find them installed in our institutions, have ample protection, and practically no risk exists from X-Ray burns either to patient or operator. Although we have, and many call it, a dangerous Ray, it also has its good points. Not every cell is acted on in a like manner. The nearer a cell approaches the embryonic type (that is the more recent in its development) the greater is the susceptibility to the Roentgen Ray.

The newly-developed cells in Cancer are therefore more easily influenced by the Ray than surrounding tissue, and if the rays can be applied to the affected part in sufficient quantity to destroy the cancer cells and not seriously interfering with the healthy cells, then one can hope to see good results. Here also applies the property of absorption. It is the absorbed ray acting on the living cell.

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NESTLING BIRDS AND FROST.

Writing from Mackay, North Queensland, under date 16/9/29, Mr. W. G. Harvey says:—

Last week the weather was extremely cold, and severe frosts occurred in most parts of the district. It would be interesting to know whether these cold snaps are fatal to nestling birds in a general way, or whether the two cases quoted in the following lines are exceptional. A young bronze cuckoo which occupied the nest of a pair of white-throated fly-eaters perished during the night of the heaviest frost. On the following day a boy reported to us the finding of a grass warbler's nest with all the young ones dead. The plant on which the nest was built was badly frosted, and the boy attributed the death of the nestling birds to the severe cold.

THE PLANT ECOLOGY OF PALM ISLAND.

By Dr. D. A. Herbert, Department of Biology,
University of Queensland.

(Continued from Vol. VII., Page 56.)

On one ridge at an elevation of about 1000 feet a peculiar local ground flora of ferns, usually found epiphytic in the monsoon or rain forest, was encountered. Growing on the stony soil and the rocks were Polypodium (Drynaria) quercifolium (the oak leaf fern); Asplenium nidus (the birds' nest fern); and platycerium alcicorne (the elkhorn). The oak leaf fern is interesting on account of its two types of leaf, the pinnate assimilating leaves, and the others coarsely serrate and functioning for humus collecting. These ferns were in considerable numbers on top of the backbone mountain chain of the island, which at that point was running north and south. The eastern side of the island has a heavier rainfall than the western side, which is in the rain shadow, and this ridge top apparently received enough rain to support the peculiar local growth of ferns, though not enough to turn the balance of edaphic conditions sufficiently to allow Malayan trees to dispossess the Eucalypts. The Eucalypts in this case were mainly E. alba, E. tessellaris, and E. tereticornis; i.e., those which favour the slightly moister slopes of the island. Rather numerous at this point was the only ground orchid collected in this formation—Geodorum pictum, which was in fruit at the time.

Rain Forest and Monsoon Forest.

The Malayan vegetation of Palm Island predominates in sheltered or well-watered situations. From the sea its dark green strips stand out in vivid contrast to the lighter belts of Eucalyptus forest. They correspond to the gullies of the mountain sides, the Eucalypts occupying the drier ridges. There is very little admixture. A few Malayan species are scattered through the Eucalyptus forest—for example, Homalanthus populifolius and Macaranga tanarius—but the two formations are very pure and in such a delicate state of equilibrium that the dense gully forests rise up like a wall at the edge of the gum trees, and a line may be drawn which absolutely separates the two. The dry ridges do not satisfy the moisture requirements of the Malayan types, and the dense shade of the gully forests is unfavourable to the establishment of the heliophilous Eucalypts. Occasionally the conditions are such as to favour either the one or the other formation, and a mixture known as "Bastard

Scrub'' is the result. This consists, on Palm Island, of Malayan types with trees of Eucalyptus tesselaris.

The Malayan type of vegetation in Queensland is known as Rain Forest or Scrub, and is very variable. It varies from an easily penetrable forest with few lianas and few epiphytes to rich tropical jungle, the trees laden with epiphytes; from Algae and Lichens to flowering plants, the ground covered with ferns and other herbs and shrubs; while immense lianas writhe over the ground and trees.

On Palm Island the extreme of dryness in Malayan forest is met with in places, as for example in many of the steep gullies on the sides of the mountains. The extremely moist forest is absent, though the top of Mount Bentley supports a very luxuriant flora. Hymenophyllaceae are absent, however, and there is a dearth of epiphytes except Dendrobium teretifolium, D. speciosum, Oberonia pusilla, Drynaria quercifolia, Platycerium alcicorne, Asplenium nidus, and a few other rather xerophytic species. On the eastern side of the island in a creek where descent alone was possible, more favourable conditions obtained, and epiphytic orchids and ferns were more common, though still of the same species as found on Mount Bentley. Ophioglossum pendulum, growing luxuriantly in the humus accumulated by an elk horn fern (Platycerium alcicorne) were also found at the summit of Mount Bentley. In the more sheltered places a tree fern, Alsophila rebeccae, is found, and smaller ferns clothe the ground; these include—Adiantum aethiopicum, A. hispidulum, Pteris tremula, Pteris ensiformis, and Aspidium ramosum. Lianas are very abundant, very noticeable being Entada scandens, with its large pods and stout coiling trunk; Mucuna gigantea, with its pods covered with irritating hairs; and Pothos sp., an aroid with characteristic leaves, the petiole being expanded to the width of the lamina. Rhapidophora Lovellae, another liana belonging to the Araceae is conspicuous from the size of its incised leaves. The juvenile leaves are entire; later leaves develop holes which have a necrotic origin; and in still lates cases these holes are enlarged into leaf incisions. Vitis opaca is common, and Smilax australis is in places very troublesome, especially on account of its small thorns. Galeola foliolata, a saphrophytic orchid, climbs over small trees and logs, attaching itself by means of its rather short aerial roots; it is a striking plant, but not common. Lygodium japonicum, L. reticulatum, and L. scandens, three ferns, are also characteristic of the lianoid element of the forest. Eustrephus latifolius is found also in the Eucalyptus forests.

The arborescent components of the moister forest are very numerous, and differ somewhat in detail from those of the drier parts. A few trees not noticed in the drier parts of the forest make their appearance near the top of Mount Bentley. Eugenia Johnsoni, with its leaves provided with drip tips, was flowering at the time. The root parasite, Balanops australiana, occurred only at the summit. Other trees and woody plants of the Malayan formation were:—Acronychia laevis, Terminalia muelleri, Ficus glomerata, F. cascaria, F. opposita, F. eugenioides, and F. Thynneana, Melia composita, Eupomatia laurina, Trema aspera var. viridis, Randia Fitzalani, Leea sambucina, Ratonia lachnocarpa, Panax elegans, Alyxia obtusifolia, Pleiogynum solandri, Elaeocarpus grandis, Castanospermum australe, Myristica insipida, Callicarpa pedunculata, Harpullia pendula, Alstonia scholaris, Cupania pseudo-rhus, Sarcocephalus cordatus, Tarrietia argyrodendron, Mallotus philippinensis, Canarium australasicum, Abrophyllum ornans, Mackinlaya macrosciadea, Nephelium tomentosum, Litsea zeylanica, Laportea moroides, Fleurya interrupta, and Hemicyclia australasica. Scattered palms (Archontophoenix alexandrae) occur on Mount Bentley, but on the eastern side of the island there are large groves of them. These groves are one of hte most beautiful sights on the island. The above represent but a few of the species, but are the more important components and indicate the wealth of woody species. In the drier parts of the formation a few trees not found in the moister regions are prominent. Perhaps the most noticeable is Brassaia actinophylla, the umbrella tree, whose umbrella-like cluster of terminal leaves crowned with the red flowering branches, makes it particularly conspicuous. This tree extends occasionally to the Eucalyptus forest, and its relatively modest moisture requirements enable it to flourish as an epiphyte or as a lithophyte. Found also in the drier parts are Macaranga tanarius (especially in cleared patches) and Homolanthus populifolius.

The ground covering contains the ferns Adiantum aethiopicum, A. hispidulum, Pteris tremula, Pteris ensiformis, Aspidium ramosum, and Polypodium phymatodes. Alpinia coerulea is scattered through the forest, and in the moister places Alocasia macrorrhiza forms a dense undergrowth. Its green flowers are often detected by their strong sweet scent long before they are noticed. The juice of the petioles was used with moderate success in the treatment of stinging by the giant nettle, Laportea, and its smaller ally Fleurya. In the creeks and on the more sheltered slopes Musa Banksii, the native banana, grows abundantly. Like the cultivated banana in appearance

it has not the same habit of growing in stools, though often two or three shoots may be found on the same plant. The fruits contain large black seeds and very little pulp, though what there is has a sweet banana flavour. A ground orchid—Calanthe veratrifolia—attaining a height of about four feet when in flower, is fairly common, though at the time of the visit only one specimen was found in flower.

The Malayan forest on Great Palm Island is subjected to alternating wet and dry seasons. The dry season is not favourable to a luxuriant growth of epiphytes. During the drought at the end of 1925 and the beginning of 1926, the mortality of these plants was heavy, and especially so in the case of the lithophytes. Plants of Pteris tremula, for instance, which, in the wet season had become established in rather dry situations had died. Orchids had become extremely parched and many, dying, had been blown to the ground. Elk-horn and birds' nest ferns had lost many of their leaves, and in some cases had died altogether. Such a state of affairs is very unfavourable to the most luxuriant development of the Malayan forest, and the majority of the formation certainly cannot be classified as rain forest. It corresponds to monsoon forest. This is a type produced in regions with a fairly long dry season. Where water conditions are suitable it grades into rain forest, and this is the case on Great Palm Island. The rain forest is by no means as luxuriant as, say, on Tamborine Mountain in Southern Queensland, but is sufficiently hygrophilous to be considered in the same class. It occurs on the higher peaks of the Island, as on Mount Bentley, above an elevation of about 1000 feet, and at the top of two unnamed lower peaks a little to the west above about the same elevation. The explanation of such a development in the higher parts of the island seems to be in the presence of a cloud belt. It was impossible to collect data on this in ten days, but on the two cloudy days experienced during the stay, the mist enveloped Mount Bentley approximately down to the 1000 feet level and also touched the other peaks. This, by the reduction of evaporation and by the providing of the aerial roots of epiphytes with moisture, would tend to encourage plant life.

On the eastern side of the island conditions along the creeks are more favourable to rain forest. Owing to the exceptionally steep and almost inaccessible nature of the eastern slope the formation could not be examined thoroughly. One creek was traced from its source to the sea, and was well provided with water; whereas those

on the western side were all dry beds except low down near the foot of the range. Many of the pools were deep and contained quantities of Nitella sp. A heavy rain storm swept over the eastern slope during the afternoon, though there was no sign of rain on the western side. Everything seems to point to the fact that much of the rain that comes from the south-east falls on the eastern side only. The creeks are therefore able to support a more luxuriant type of Malayan vegetation, and along them the monsoon forest grades into rain forest. Because of the dry periods, however, the epiphytes do not flourish much more luxuriantly than in the monsoon forest. The ridges are occupied by Eucalyptus and Albizzia procera, as elsewhere. Along the rugged shore is a dense formation of low trees, but this was inaccessible, so could not be examined. It probably consisted largely of Careya australis and species of Ficus, low trees found in a similar position on Eclipse Island.

Unimportant ecologically, but interesting because of their bizarrity, are Rhizomorpha harrimanii and Balanophora fungosa, the former in the rain forest, the latter in the drier monsoon forest. The Rhizomorpha is a sterile fungus growing in mat-like shaggy masses on dead wood on tree trunks. Balanophora fungosa, a phanaeroganic parasite, attacks the roots of various trees, including Ficus spp. Only one flowering specimen was collected in 1925, but a large number of specimens in bud were obtained. In 1926 the long dry spell had apparently checked its development, for not a single specimen could be found, though the same patch of forest was searched. August and September are the normal flowering months elsewhere in North Queensland.

(To be continued.)

QUEENSLAND NATURALISTS' CLUB.

Annual Receipts and Expenditure 31st January, 1930.

RECEIPTS.	£	s.	d.
To Cash at Banks	26	4	5
„ Members' Subscriptions	62	1	0
„ Donation		10	6
„ Tent Hire		10	0
„ Flower Show	57	18	8
„ Sale of "Naturalist"	1	10	0
„ Lantern Hire	1	1	0
„ Surplus from Excursions		12	6
„ Interest in G.S.B.	1	4	0
	£151	12	1

EXPENDITURE.	£	s.	d.
By Printing "Naturalist"	43	14	0
„ Blocks for "Naturalist"	8	2	4
„ Rent	12	10	0
„ Sec., Petty Cash	15	0	0
„ Flower Show	19	18	6
„ Insurance		6	7
„ Book Wrappers	1	5	6
„ Space in University Handbook		6	0
„ Affiliation to Horticultural Society		10	6
„ Cheque Book		5	0
„ Books for Library	2	5	2
„ Balance at Bank, 31/1/30	47	8	6
	£151	12	1

31st January, 1930.

C. W. HOLLAND,
Hon. Auditor.

NATURE LOVERS' LEAGUE.

Annual Receipts and Expenditure, 31st January, 1930.

RECEIPTS.	£	s.	d.
To Balance at Bank	10	0	4
„ Sale of Certificates		11	4
	£10	11	8

EXPENDITURE.	£	s.	d.
NIL			
By Balance	10	11	8
	£10	11	8

31st January, 1930.

C. W. HOLLAND,
Hon. Auditor.

The Queensland Naturalist.

JOURNAL OF THE QUEENSLAND NATURALISTS' CLUB AND NATURE-LOVERS' LEAGUE.

VOL. VII. OCTOBER, 1930. No. V

PROCEEDINGS.

EVENING MEETING, Tuesday, 18th March, 1930.—The president (Mr. C. T. White) occupied the chair, and 66 members and visitors were present. Reports on the excursion to Belmont were given by Messrs. G. H. Barker (birds) and Mr. C. T. White (botany). An exhibit of dried plants from the Burnett district was tabled by Mrs. M. Smith. The specimens were commented on by the president. A most interesting lecture, illustrated by lantern slides, on the new flora and fauna of Krakatau was given by Prof. E. J. Goddard.

EVENING MEETING, Monday, 14th April, 1930.—The president (Mr. C. T. White) occupied the chair, and about 30 members were present. Messrs. J. F. Miles and S. C. Sullivan were elected members of the club. Reports on the excursion to White's Hill were given by Mr. J. O'N. Brenan (birds) and Mr. C. T. White (botany). A very interesting lecture on "Nature and Natives in Papua" was delivered by Mr. J. E. Young. The lecturer illustrated his remarks by a series of lantern slides and exhibits.

EVENING MEETING, Monday, 19th May, 1930.—The president (Mr. C. T. White) occupied the chair, and about 30 members were present. Reports on the Easter excursion to Amity Point, Stradbroke Island, were given by Mr. J. E. Young (zoology and general) and Mr. C. T. White (botany). Dr. E. O. Marks spoke on the geology of the island. Mr. H. Tryon showed pieces of pelt of the various kangaroos and wallabies found on Stradbroke Island and spoke on the natural history of the island.

Reports on the excursion to Gold Creek on Labour Day were given by Mr. J. O'N. Brenan (birds) and Mr. L. Franzen (insects). Mr. Franzen further exhibited the male and female of two very interesting insects, **Taeniochorista pallida** and **Oedocymlus pallidus**. The type specimen of the former species described by Mr. Esben Petersen (Silkeborg) was lost during the war, and the finding of the species again was very gratifying. Mr. J. Nebe exhibited a number of stereoscopic views of Olsen's Caves near Rockhampton, and spoke on the desirability

of these caves being preserved as a national possession. Mrs. Estelle Thomson exhibited a collection of wattles largely from the Granite Belt, also a collection of paintings of Queensland wild flowers.

SPECIAL MEETING, Tuesday, 27th May, 1930.—A most interesting lecture on "Australian Orchids" was delivered by Mr. E. E. Pescott (Melbourne). The president (Mr. C. T. White) occupied the chair, and about 60 members and visitors were present. With the aid of lantern slides, many of them beautifully coloured, the lecturer dealt with the various genera of Australian orchids. He mentioned that twenty-years ago only 84 species of orchids were listed for Victoria, but largely through the efforts of a band of enthusiastic students and collectors the number had been brought up to 150, and no doubt more remained to be found.

SPECIAL MEETING, Monday, 9th June, 1930.—The president (Mr. C. T. White) occupied the chair, and about 50 members were present. Mr. A. G. Hamilton (Sydney) delivered a lecture on the "Cross-Pollination and Fertilisation of Flowers." The lecturer, who is well known for his own researches in this respect on the Australian flora, illustrated his remarks by a series of lantern slides, many of them coloured. The effects of the various agencies—air, wind, water, insects, and birds—in bringing about cross-pollination were clearly indicated.

EVENING MEETING, Monday, 16th June, 1930.—The president (Mr. C. T. White) occupied the chair, and about 20 members were present. Mrs. Giles and Misses M. Temperley, I. Larsen, I. V. Rolfe, and E. M. Walsh were elected members of the Club. As the Club's representative at the meeting of the Australasian Association for the Advancement of Science held at Brisbane during May, Dr. F. W. Whitehouse read a brief report on the work of the Congress. Reports on the excursion to Goodna and Woogaroo Scrub were given by Messrs. J. E. Young (general), J. O'N. Brenan (birds), and C. T. White (botany). Mr. L. Franzen exhibited some interesting neuropterous insects and a beautiful hawk-moth. Mr. R. L. Higgins exhibited a native axe lately found at Tugun, S.E. Queensland. Mr. Higgins also mentioned having seen bee-eaters (Merops ornatus) eating honey-bees at Bulimba (Brisbane). Mr. C. T. White exhibited a fruit of **Parinarium laurinum**—a Solomon Islands tree—picked up on the beach at Jumpin-pin, Moreton Bay, by Mr. D. Curtis. Mr. White also exhibited an underground fungus (Mylitta australis?) from Toowoomba, a species

of Piper from Papua, used in native sorcery and strings of shell money from the New Hebrides.

EVENING MEETING, Monday, 22nd July, 1930.—The president (Mr. C. T. White) occupied the chair, and 37 members and visitors were present. Miss M. Robinson, Miss S. Foott, and Mr. T. B. Stevens were elected members of the Club. Mr. L. Franzen exhibited various specimens of Neuroptera, including a rare notiobiella and a Sisyra, of which only the two in the exhibitor's collection were known. Mrs. Estelle Thomson screened coloured lantern slides of a number of Queensland wild flowers. Mr. J. E. Young screened a number of miscellaneous natural history slides. Dr. D. A. Herbert exhibited specimens of (a) Equisetum sp., a "Horsetail" grown at Brisbane, and (b) Myrmecodia sp., an "Art Plant." Mr. J. H. Simmonds, Jr., showed (a) specimens of **Balanophora fungosa** collected at Kin Kin, S.E. Queensland, and (b) specimen of wood picked up on the beach, showing polishing effect of sand. Mr. J. H. Simmonds, Senr., showed specimens of (a) two seeds of **Trapa bicornis,** the water chestnut, and (b) fruit of a South-Sea Island Ivory Nut (Metroxylon sp.). Mr. J. E. Young showed specimens of the nest of the Magnificent Spider (Dierostichus magnificus); these were commented on by the Director of the Queensland Museum (Mr. H. A. Longman), who had made a special study of this spider. Mr. C. T. White exhibited a fruit and seeds of **Macrozanonia macrocarpa** from the Aru Islands.

EVENING MEETING, Monday, 18th August, 1930.—The president (Mr. C. T. White) occupied the chair, and about 33 members were present. A report on the birds seen at Sunnybank on the occasion of the Club's visit was given by Mr. G. H. Barker. Mr. J. E. Young gave a general report on the excursion to Blunder Creek, and remarked on the wonderful growth of **Boronia rosmarinifolia** and **Pultenaea villosa** seen. Considerable discussion ensued on the effects of heavy picking of wild flowers in the Sunnybank and Blunder country.

The principal business of the evening was a lecturette by Mr. C. E. Hubbard, a visiting botanist from the Royal Botanic Gardens, Kew, England, on "The Grasses and Grass Lands of the Moreton District." Considerable discussion followed the lecture, and Mr. Hubbard promised later to prepare a paper on the subject for printing in the "Queensland Naturalist."

Exhibits included (1) by Miss Cook, a peculiar placental growth from the fruit of a Papaw (Cariea), giving the impression of a fruit within the fruit; (b)

by Mr. J. E. Young, flowering specimens from his garden of the following Proteaceae: (a) Grevillea Hilliana, (b) Macadamia ternifolia, and (c) Hicksbeachia pinnatifolia; and (3) specimens of West Australian wild flowers, sent by Mrs. Wilsmore. These last were commented on by Dr. D. A. Herbert.

The President said that in response to circulars sent out, several sets of specimens had been received by the Wildflower Names Committee. Copies of the circular were available for anyone desiring them.

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ANNUAL WILDFLOWER SHOW AND NATURAL HISTORY EXHIBITION.

Saturday, 13th September, 1930.

The Annual Wildflower Show and Natural History Exhibition was opened again this year by His Excellency the Governor (Sir John Goodwin) at 3 p.m.

His Excellency, who was introduced by the President, expressed his pleasure at being present. He thought the range of flowers at this year's Show seemed better than usual, and he hoped that the Show would continue to be held each year. After referring to some of the exhibits, he made a plea against the indiscriminate picking of bush flowers. A bouquet of wild flowers was presented to Lady Goodwin by Miss Moira White. A vote of thanks to Sir John and Lady Goodwin, proposed by Mr. G. H. Barker, was carried by acclamation.

Flowers were received from Perth, Adelaide, and Sydney, as well as from various parts of this State. Local exhibits were staged by Mrs. Aubrey Thomson (Eight Mile Plains), Mr. J. E. Young and Mr. C. T. White (Chermside). The North Coast was represented by beautiful blooms of Boronia, Epacris, Silky Oak, Bottle Brushes, etc., from Howard, Emmundi, Mooloolaba, and Coolum Beach, sent in by Miss N. E. Watson, Miss Ball, Mr. C. Clark, and Mr. L. Perry-Keane respectively. The islands of Moreton Bay showed Epacris, Boronias, Bottle Brushes, and other flowers, exhibited by Mrs. W. M. Mayo and Miss Welsby. Mrs. E. Congeau and Mr. Davis sent Boronias and Epacris from Bribie Island.

Miss M. Birt, of Southport, staged an interesting exhibit. A fine display of wild flowers from the Lamington National Park was tabled by the O'Reilly Bros. Mrs. S. E. and Mr. D. Curtis, of Albert River, exhibited many beautiful flowers from the river scrubs and sandstone hills, the latter including a fine display of Fringed Myrtle (Calythrix). From Springbrook, Mr. W. Rudder

brought a wonderful collection, conspicuous among them being Epacris, Hovea, Prostanthera, Everlastings, etc. The exhibit from Tambourine Mt. sent by Mrs. H. Curtis, showed a Macrozamia Denisonii cone, a number of ground orchids, and white and yellow Everlastings. From the Granite Belt, Mrs. C. Gittins, Miss J. Westcott, Mrs. S. A. Slaughter, and Mr. M. Greener sent characteristic specimens, including Epacris, Pomaderris, and Granite Boronia. Mrs. J. W. Waraker forwarded an interesting exhibit from Nanango, and Mrs. A. McLaughlin from Springsure. The Sydney specimens were sent by Miss Steinbeck; those from Adelaide by Messrs. J. F. Bailey and E. H. Ising; and the West Australian, which included some from Central Australia, by Mrs. J. Wilsmore. Specimens of Geraldton waxplant (Chumaelaucium) grown in Brisbane, were shown by Mrs. W. M. Mayo and Mrs. Hammond, also Crotolaria Cunninghamii by Mrs. Clark, and native orchids by Miss D. Williams.

The State School Competition attracted seventeen (17) entries, prizes (donated by Mr. G. H. Barker) being awarded to Howard, Springbrook, Thulimbah, and Helidon, after having been judged by Mr. C. T. White and Dr. D. A. Herbert. The competition for Wildflowers arranged for decorative effect had nine entrants: first place being allotted to Miss D. Grimes for flowers in a vase, and Miss G. Wood for bowl, and special mention for Mr. D. Curtis's display: judged by Mrs. W. Ewart.

Some wonderful photographs of natural history subjects (birds, animals, and plants) sent in by the Harvey Bros. (Mackay) were greatly admired, and a very large series of orchid studies by Mrs. Herbert Curtis attracted considerable attention.

Shells from Mr. J. H. Simmonds, Senr., butterflies and beetles from the collections of Mr. L. Franzen and the late Mr. R. Illidge were objects of great interest. In this branch of natural history the Club was also indebted to the Department of Agriculture and Stock for a number of exhibition cases of insects of economic importance.

The thanks of the committee are due to the members and friends who sent and arranged the flowers and other specimens, to Mrs. W. Ewart, and Dr. Herbert and Mr. C. T. White for judging the competitions, to Mr. E. W. Bick for the loan of pot plants, to the University for the loan of tables, and to the different lady members of the Club for selling flowers. Special thanks is due to the Honorary Secretary (Miss E. E. Baird) in connection with the Exhibition, as it was largely through the work

of the Honorary Secretary that the sueeess of the Show was insured.

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BIRD NOTES

Taken on Club's Visit to Goodna and Woogaroo Scrub, Upper Brisbane River, 3rd June, 1930.

By J. O'Neil Brenan.

Taking advantage of the holiday on the King's Birthday, members of the Queensland Naturalists' Club and some of their friends paid a visit to the Woogaroo Scrub.

A westerly wind not only appeared to keep the birds quiet in the early part of the day, but also made it difficult to always identify all that were seen. I was able to note the following species: The Leatherhead and his small relative, the Little Friar Bird, Noisy Miner, Grey Butcher Bird, Black-headed Pardalote (chip chip), Tranquil Dove, White-shafted Fantail, Lewin Honeyeater, Golden and Rufous-breasted Whistler, Tree-tit, Yellow-rumped tit, Dusky Wood Swallow, Welcome Swallow, Scaley-breasted Lorrikeet, Currawong or Scrub Magpie, Jacky Winter, Willy Wagtail, Rainbow or Bee-eater, Yellow-faced Honeyeater or Chiek-up, Mistletoe Bird, Pee-wees, Crows and Black-shouldered Kite. The Leatherheads were fairly numerous, and their well-known prattling voices, especially towards evening, could be heard all around the bush outside of Goodna.

The Black-shouldered Kite ranges all over Australia, but is rarely seen in any numbers; in fact, I have only seen the bird in pairs. He is a beautiful bird, slightly over 12 inches long. Upper part delicate grey, head and under part white, black shoulder and patch under wings, tail greyish white.

He obtains or catches all his food, which consists of small reptiles and insects, from the ground, and works the likely places, grass or cultivated paddoeks, by hovering beautifully some height up. If going against the wind, he remains motionless as if suspended or resting on an invisible wire. When he sees or thinks he sees anything, he drops gently like a small paraehute on the intended victim. Too frequently, I am afraid, he has been mistaken for a Sparrow Hawk, and shot, but really he is one of the most useful birds we have. The size of his feet or claws show that he was never created to deal with anything more powerful than an inseet or small reptile.

He has a close relative, the Letter-winged Kite, an inland bird, very seldom seen on the coast, whose colouring is the same as the Black-shouldered, except that the black extends on the under angle of the wing, forming the letter W when the wings are extended, hence the name. I think this species catches mice or small rats.

One of the first birds noted on the way to the Woogaroo Scrub was the Dusky Wood Swallow. He was chasing some insect, which finally fell to the ground, when the bird dropped down and caught it, taking it to a nearby branch, beating it into a convenient shape, then swallowing it. The bird has a wide range, but in some parts of the Southern States is a migrant, arriving in August or September, and departing in April. Apparently they feel the cold, for in winter or rainy weather they go to roost in a cluster on the underneath side of a leafy tree. Those that I have seen have been about 6 feet from the ground, just like a large swarm of bees hanging on to each other. A. J. Campbell mentions that occasionally a few dead ones are found underneath where they have been hanging; probably they were suffocated or died from cold. When they have been suddenly dispersed by fright, the simultaneous noise created by the multitude of wings has been compared to a mild clap of thunder. The swarms I have seen were not large enough to make such a noise, but quite loud enough to startle his horse if riding close by.

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REVIEW.

AUSTRALIAN RAIN-FOREST TREES:—Excluding the species confined to the Tropics. By W. D. Francis, Assistant Government Botanist, Brisbane, pp. XI, 347. Including numerous illustrations. Government Printer, Brisbane, price 10/.

The work under review is undoubtedly one that should be in the hands of all those who are at all interested in Australian trees. To people in States other than Queensland and New South Wales it reveals the wealth of tree species to be found in the New South Wales brushes and Queensland scrubs as the rain-forests are termed in their respective States. To the tree-lovers of these two States of the Commonwealth the work should be of distinct use for the purpose of identifying the trees of the rain-forest areas. Probably no one was better qualified than Mr. Francis to produce such a book, as interest in and intimacy with the Australian sub-tropical rain-forest have given him a won-

derful knowledge of the trees that compose it. Southern botanists may be inclined to criticise the lack of information regarding some of the more temperate rain-forest species. For instance there seems no reason why Fagus Moorei should receive two and a half pages while its relative, F. Cunninghamii should receive only a few lines. Ceratopetalum apetalum, the coach wood, receives but scant notice compared with some of its allies, yet in New South Wales it is the dominating species in many of the rain-forests, and commercially ranks hardly second to any. The term rain-forest is perhaps rather a vague one, but one would fancy that Tasmanian botanists would look for such important species as Phyllocladus rhomboidalis (Celery Top Pine), Dacrydium Franklinii (Huon Pine), etc.

The descriptions and illustrations of the species are preceded by a synoptical account of the families and a table or key to enable identifications to be made. In this latter the first arrangement into groups is rather good, but the subsequent arrangement within the groups is rather misleading, giving the impression that the work was done rather hurriedly.

A pleasing feature of the work is that the descriptions have all been drawn up from ample material, and in a very large number of cases from living specimens. This is in marked contrast to most Australian works on the region where the authors have been content to use Bentham's descriptions from the "Flora Australiensis" with little or no modification.

Most of the species are illustrated by a picture of the tree in the field, and of a plate showing the leaves, flowers and fruits.

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THE PROGRESS AND THE PRESENT NEEDS OF QUEENSLAND PALAEONTOLOGY.

By Dr. F. W. Whitehouse, Dept. of Geology, Queensland University.

(Presidential Address delivered before the Queensland Naturalists' Club, Monday, 17th, February, 1930.)

Fossils in the sedimentary rocks of what is now the State of Queensland were first discovered in the early days of settlement and inland exploration. Settlement in Queensland dates from 1824. In 1826 the important coal seams of the Ipswich district were discovered. Considering how rich those coal measures are in fossil plants such fossils must have attracted attention in those very early years; but there does not appear to be any reference in

literature to Queensland fossils until about twenty years later.

In 1844 Dr. Ludwig Leichhardt made his memorable journey from Moreton Bay to Port Essington, and in the records written around that expedition appear the first references to both animal and plant fossils from Queensland territory. The late Rev. W. B. Clarke, who in 1847 and 1848 described these fossils, may thus be regarded as the founder of Queensland Palaeontology.

In the eighty years that have passed since Clarke published his work the progress in the study of the fossil faunas and floras of this State has been particularly interesting. It is not the purpose of this paper to give a chronological account of these advances, but it may be of interest to note that no fewer than fifty-eight palaeontologists have assistsed in this work on Queensland fossils. The list of these workers is as follows: Charles Anderson, D'Oyly Aplin, Newell Arber, W. H. Benson, J. S. Bowerbank, W. H. Bryan, W. Carruthers, Frederick Chapman, W. B. Clarke, Sir Edgeworth David, Sir William Dawso, Henry Deane, C. W. De Vis, W. S. Dun, B. Dunstan, R. Etheridge, R. Etheridge, Jr., Baron von Ettingshausen, O. Feistmantel, J. W. Gregory, Charles Hedley, Rudolf Heinz, Dorothy Hill, G. J. Hinde, Walter Howchin, H. A. Longman, C. Lumholz, B. Lundgren, Richard Lydekker, J. H. Maiden, John Mitchell, Sir Frederick McCoy, Allan McCulloch, Charles Moore, C. T. Musson, Alleyne Nicholson, Sidney Olliff, Sir Richard Owen, John Phillips, W. H. Rands, Felix Ratte, J. H. Reid, H. C. Richards, Birbal Sahni, H. G. Seeley, A. C. Seward, John Shirley, Stanley Smith, Voss Smith, L. F. Spath, Marie Stopes, Julian Tenison-Woods, R. J. Tillyard, A. B. Walkom, J. H. Walton, F. W. Whitehouse, H. Woodward, and Sir Arthur Smith Woodward.

Although some of these workers, e.g., Sir Richard Owen, were interested purely in the biological aspect of the fossils the progress of geological enquiry in Queensland owes much to the fact that most of these palaeontologists were keenly alive to the stratigraphical importance of the faunas and floras which they examined.

The year 1892 is the culminating period in the history of Queensland Palaeontology. Previously most of the work was in the form of records or description of small collections of fossils, either from some particular area or belonging to some definite biological group. But three works of outstanding importance appeared in these early years which satisfactorily laid the foundations of stratigraphical palaeontology in Queensland. In 1870 Charles

Moore, of Bath, described the rich faunas which the Rev. W. B. Clarke had collected from the Cretaceous beds of Wallumbilla and the surrounding districts. This great work fortunately was illustrated by a magnificent set of plates; for, in 1882, most of the specimens, including the great majority of the holotypes, perished in the Palace Garden fire in Sydney. All that remains of this collection is now in the Museum of the Literary and Philosophical Society of Bath, England.

In 1872 Richard Daintree published his epoch-making work on the Geology of Queensland. This account largely was based on his own field work mainly in the north of the State, and was to have been extended by palaeontological investigations upon the large and important collections of fossils which he had made. Unfortunately, the ship "The Queen of the Thames," on which Daintree was sailing to England, was wrecked and sank off the coast of Africa. After some time the ship and its cargo were salved and the fossils found their way to England. The fauna of this important collection, from Carboniferous, Permo-Carboniferous and Cretaceous beds, was described by Robert Etheridge, Senr., and the fossil plants, of Devonian, Permo-Carboniferous and Triassic age, by William Carruthers.

In 1880 Robert Etheridge, Junr., published the third of these important early papers, a "Report on a Collection of Fossils from the Bowen River Coal Field and the Limestone of the Fanning River, North Queensland." The fossils described in it were of Devonian and Permo-Carboniferous age.

The year 1892 saw the publication of the monumental work by Dr. R. L. Jack and Robert Etheridge, Junr., on "The Geology and Palaeontology of Queensland and New Guinea." This amazingly complete work forms the standard reference for all later investigations into geological and palaeontological problems in Queensland. Etheridge was responsible for the paelaeontological investigations. His work took the form of a critical revision of all published accounts of Queensland fossils and a description of all the vast collections from the State lodged in the various Museums. To Queensland Geologists it is a work of comparable scope and comparable value to that of Sowerby in England, d'Orbigny in France, Goldfuss in Germany, and Hall in the State of New York.

Since that time most of the palaeontological progress in the State has been an amplification of this great work. Four monographs, however, are of particular importance

in this later development, namely Etheridge's own work on the Cretaceous faunas of Central Queensland, Walkom's invaluable account on the Mesozoic Floras, Longman's descriptions of the vertebrate faunas, and Tillyard's monograph on the Mesozic Insects. The last-named work is of particular interest, not only from its great biological value, but in that Tillyard made use of a new type of percentage classification to determine the geological horizon—a method recalling the classical revision by Charles Lyell of the Tertiaries.

Within the past few years the science of Palaeontology has been undergoing a change that yet has hardly influenced the work on fossil faunas and floras of Australia.

Always there have been two main attitudes towards Palaeontology—that of the field observer and that of the museum specialist. The one worker is interested in the general succession of floras and faunas, while the other is concerned with the inter-relationship of species and genera within some one biological group. With the growing recognition of features of homoeomorphy and, particularly of late, since the theory of Orthogenesis has made such rapid changes in the attitude of palaeontologists, the two "schools," if so they might be called, have become more closely related. The field palaeontologist, intimately concerend with zonal successions, is relying more on phylogenetic developments to define such zones, while the specialist in turn relies upon accurate zonal collecting to make his phylogenetic classifications more quantitative and exact.

Modern palaeontology has changed very markedly in two directions: there has arisen a demand for the closest possible zonal classification of faunas and faunal stages, while, on the other hand, it has been necessary to revise old generic classifications defining genera within very much more narrow limits than previously. Such modern work independently was begun upon the ammonites by Hyatt and Buckman in the latter half of last century, Hyatt working on Museum material, and Buckman tracing out the progressive development of species through the sequence of beds exposed in the British sections. Since that time similar work has been carried out on other branches almost exclusively by field palaeontologists—Marr, Nicholson, and Miss Elles on the graptolite succession; Vaughan, Carruthers and Stanley Smith on the Carboniferous corals; Wedekind on the Silurian and Devonian corals; Walcott and Ulrich on the Lower Palaeozoic trilobites; and so on. To some groups,

e.g., the lamellibranchs and the gastropods the methods have hardly yet been applied.

Perhaps, from the point of view of a worker in this country, the most marked change wrought by modern methods has been in generic nomenclature. Under the older methods most genera included a very large number of species. While many such genera undoubtedly are of monophyletic origin it has been shown repeatedly that the group of species constituting a "genus" really often represented a collection of subsidiary groups of widely different origin (as e.g. in "**Cyathophyllum**") or else (as in "**Productus**") such species were naturally grouped into smaller assemblages of related forms which well could be separated one from another, and defined as separate genera. The old, large, unwieldly genera usually were of little value for correlation. By their aid it was usually possible to fix a fauna in its proper period, or perhaps to narrow it to the early, middle, or late portion of that period. But for more precise correlation such "genera" usually were useless. As a result, in correlating the faunas of a country such as this, so far removed from the standard sections of Europe and America, more reliance usually was placed upon species. Such methods, however, lead to many inexact determinations. European species have been recorded very frequently from the Australian faunas; but frequently such a name as applied in Australia, covers a large section of the group to which the original species belongs and not merely the species itself. As example of such usage one may quote the records in Australia of **Spirifer disjunctus** and **Productus semireticulatus**—in the former records the "species" really includes a number of forms of the genus, **Cyrtospirifer,** to which the original **S. disjunctus** belongs, while the so-called "**Productus semireticulatus**" in Australia is really a suite of species of the genus **Productus** (sensu stricto).

No one recognised more keenly than Etheridge the importance of correlation by species groups rather than by species. But, under the older methods, when such groups were not specially defined, correlation by these methods was virtually impossible—for necessarily it involved a detailed investigation of the groups within every genus concerned. Modern phylogenetic work, although it has caused a multiplication of generic names bewildering to all but the specialist, is making the correlative work in distant countries very much easier, in

that, to a large extent, the old speeies groups are now arranged and defined as genera of limited stratigraphieal range.

That in Queensland little work has been done with sueh methods is to no one's diseredit. Etherdige died just about the time when these methods were beeoming appreeiated, and most of the subsequent work on Queensland fossils has been earried out on groups that overseas have not yet yielded to sueh precise treatment.

It is of interest that McCoy, to whom Australian Palaeontology owes so much, may really be regarded as the founder of these methods. MeCoy, possibly more than any palaeontologist of his age, was eonvineed of the need for elose generic subdivision of the larger groups.

In older eountries, where there are many workers in elosely settled areas, there is a natural tendeney to deery modern palaeontologieal work by purely museum methods. In sueh eountries the palaentologist should undoubtedly be his own eolleetor. But here in Queensland, where there are so few workers in sueh a vast territory, it will be a long time before "arm-chair palaeontology" can ever be abandoned. At present there are urgent needs for palaeontologieal work on three main lines:—

(1) The deseription of faunas and floras that continually are being colleeted by geologists from scattered loealities—i.e., a eontinuation of previous methods;

(2) A more detailed investigation into the genera present in the known Queensland faunas and floras; and

(3) Detailed zonal work on suitable seetions.

About the first method there is little to say. Careful work using the second method, partieularly on sueh groups as the eorals, eehinoderms, bryozoa, branehiopods and eephalopods, is urgently needed to solve many of the problems that have troubled Australian geology for so long—sueh problems as the eorrelation of stages in the Devonian, Carboniferous and Permian sequenee, for example. Considering the progress that has been made in reeent years in the investigation of faunas and floras of these ages in other eountries, it is not too mueh to say that not only will preeise generie investigation solve the problems of eorrelating the faunas of adjaeent States in the Commonwealth; but that a more or less precise correlation with the sequenee in other eountries would not long be deferred.

To emphasise the need for closer generic work is not to decry the urgency of species investigation. While such work upon generic relationships must be the most valuable method of making correlations with beds in other countries, correlation by means of species will still remain the method of work in dealing with the faunas and floras within the continent.

The urgency for applying the third of the methods outlined is so obvious that they need hardly be stressed. The difficulties that arise in correlating newly-found faunal assemblages in Queensland is due almost entirely to the paucity of our knowledge of the sequence in any typical area.

Particularly at the moment is the need for zonal work acute. Within the past few years there have been accumulating a large number of collections from many areas and geological formations. In the absence of zonal details much valuable information which otherwise could be obtained is withheld from the worker, whose task it is to describe the collections. Apart from this general need there is a demand at the moment for zonal details in certain areas where it would be of great economic advantage. A precise knowledge of the succession of floras in the Walloon Series and that of the Cretaceous faunas would be of great value in the mapping of those areas in Queensland where boring for mineral oil is being carried on. Some such work has been done on the Cretaceous succession, but much more is needed.

A detailed zonal investigation into the succession of fossils in many of the geological formations is necessary if Palaeontology is to afford the valuable help in Queensland which it has given in other countries to the prospecting of areas for water, coal, and oil.

The need for accurate work by these three methods is being felt not only in Queensland but in each State of the Commonwealth. But it is pleasing to note that in practically all of the States the number of workers in Palaeontology is increasing. The present needs are great, but this increasing interest in palaeontological work most probably means that the time is not far distant when these methods which really have not yet been fully applied in any of the older countries, will be more widely used in the solution of the many problems of Australian Geology.

THE PLANT ECOLOGY OF PALM ISLAND.

By Dr. D. A. Herbert, Department of Biology, University of Queensland.

(Continued from Vol. VII., page 72.)

Grassland.

Behind the strand, and a little to the south of the tidal creek which meanders through the plain enclosed by the horse-shoe range to the north of Challenger Bay, are a few acres of what is apparently original grassland. This area is sandy and gently undulating. On the rises a few trees of the northern bloodwood (Eucalyptus terminalis) are established, giving a savannah formation with Cycas sp. forming the second story. In hollows where the water is held the grassland gives place to a Melaleuca leucadendron—Phragmites communis swamp association. The composition of the grassland is very uniform and consists of an almost pure consocies of Anthistiria imberbis. An occasional plant of Heteropogon contortus is found, and a count showed that the individuals of the two species were in the proportion of 200 : 1. Anthistiria is shallow rooting, and none of the plants examined had formed any seed, though they had flowered abundantly. This grass is very readily suppressed, therefore, by firing, the whole plant being killed and practically no seed being present to re-colonize the burnt-over area. Heteropogon, on the other hand, is deep-rooting and has an abundance of seed, and after the firing of this grassland becomes established as the dominant species. An enemy of the kangaroo grass, second in importance to fire, is Cassytha filiformis, the Bush Dodder, which destroys it along the shore, and gives an advantage at this point to low strand plants such as Cenchrus echinatus, the Burr Grass, and Vitex trifolia.

Another type of grassland is found where the forest has been burnt over. On Great Palm Island the burning of the forest results in a clearing of the shrubs and herbs, but the trees are generally left, except at the edges of the monsoon forest, which is particularly sensitive to fire. Along the margins of the monsoon forest in such cases will be found a treeless strip, which has become colonized by tall grasses. These persist through the open Eucalyptus forest, but of course are not pure grassland in this case. Four grasses are found commonly—Heteropogon contortus, Panicum trachyrachis, Stipa semibarbata, and Anthistiria imberbis, the latter very scattered. The three former are tall grasses and form dense thickets three to five feet in height. Panicum trachyrachis occurs through the Heteropogon, but Stipa more usually forms communities several yards or more in diameter, or strips along the

edges of the Malayan forest. Pure grassland of this type is to be seen on some of the smaller islands adjacent to Great Palm. The species forming it are heliophilous and re-colonization of the area by forest is preceded by a smothering of the grasses. Particularly important in this regard is Passiflora foetida, a passion vine whose glandular hairs produce a sticky foetid secretion Ipomoea quinata, a small convolvulaceous vine found amongst these grasses is too small to have any smothering effect. Macaranga tanarius is a pioneer tree in the invasion of the grassland and the grasses are gradually eliminated beneath its canopy, and seedlings of forest trees make their appearance. Homalanthus populifolius, another pioneer, is not nearly so important as a suppressing agent.

Swamps.

Two types of swamp formation are met with on Palm Island—the freshwater swamps of the low-lying plain on the western side of the island, and the somewhat brackish swamps found on lower flats to which the sea has a very limited access.

(a) Freshwater Swamps.

The plain enclosed by the horse-shoe range on the western side is drained imperfectly by a mangrove-lined creek and its tributaries which, in the wet season, are fed by the mountain streams sweeping down rocky gorges. The low-lying country is very swampy, and water lies about for the greater part of the year. Part of it has been drained and cleared, and the reclaimed area planted with coconuts, bananas, papaws, melons, and minor crops. Constant firing of the dried reeds and ringbarknig of the trees has altered the original vegetation to a great extent, and open forest species and weeds have invaded the original swamp areas. Chief amongst these are Urena lobata, Hibiscus radiatus, H. tiliaceus, Heteropogon contortus, and Passiflora foetida. The latter tends to smother the Heteropogon, which is one of the first immigrants.

In the few untouched swamps the characteristic vegetation is an association of Melaleuca leucadendron with Phragmites communis. The paper-barked Melaleucas are stout trees of thirty to forty feet with their bases in a few feet of water. Phragmites, the red, grows thickly between. Towards the edges of the swamp is found Polygonum barbatum, and a Scirpus, not flowering at the time, grows in occasional clumps. On the higher land the Melaleuca still occurs, but the reeds and rushes are replaced by Anthistiria imberbis, with an occasional Heteropogon contortus. Where fires had swept this higher land the Anthistira was destroyed and its place taken by Heteropogon

(To be continued.)

THE
QUEENSLAND NATURALIST
JOURNAL OF THE QUEENSLAND NATURALIST' CLUB AND NATURE-LOVERS' LEAGUE

VOL. VII. JULY 1931 No. VI.

PROCEEDINGS

EVENING MEETING, Monday, 20th October, 1930. —The President (Mr. C. T. White) occupied the chair and there was a good attendance of members and visitors. The Excursion Secretary reported that owing to wet weather the excursion to Castra had to be abandoned. Mr. J. Nebe, who visited the locality later, however, tabled a collection of forty specimens of wild flowers and ferns from there. A large collection of plants from sandstone hills at Upper Albert made on the occasion of the Club's visit there at the end of August was staged by the President, who reported the finding of a wattle apparently new to science. Dr. E. O. Marks spoke on the geology of the area. A report on the birds observed at Sandgate when the Club entertained members of the Royal Australasian Ornithologists' Association was given by Mr. G. H. Barker. A general report on the excursion to Enoggera Reservoir was given by the Hon. Excursion Secretary (Mr. J. E. Young). Specimens of potato fruits from Bribie Island, flowers of a double snapdragon, and specimens of a vegetable caterpillar were shown by Dr. D. A. Herbert. Some rare insects, including stone flies, butterflies and Neuroptera collected near Cedar Creek were exhibited by Mr. L. Franzen. A couple of flowering spikes of the Gum Orchid (Cymbidium suave) were shown by Mr. J. H. Simmonds. Mr. J. H. Simmonds, Jnr., showed young barnacles on the gills of a crab a very unusual habitat, also nitrogen gathering nodules from the roots of Cowpea and Mauritius Bean, the latter being exceptionally large. Mr. J. E. Young showed specimens of the fruits and seeds of the Annatto (Bixa Orellana) used by the natives for painting mats, and two boxes of insects from New Guinea, also a few local insects of special interest. Mrs. Estelle Thomson showed stereoscopic photographs of ground orchids (Corysanthes) made by Mrs. Eaves (Victoria) and photographs of the White Throated Warblers' nest and of the Tongue Orchid (Dendrobium linguaeforme) taken at Eight Mile Plains by Mr. W. J. Sanderson, also an especially large plant of Dianella laevis from Tugun. Mr. F. O. Nixon exhibited seven eggs of the Long-necked Tortoise. Mr. H. G. Barnard comment-

ed on these, stating that as far as he had observed the Long-necked Tortoise always laid her eggs soon after rain. A series of stereoscopic photographs were tabled by Mr. J. Nebe. Dr. E. O. Marks reported that a meeting of subscribers to the Skertchly Memorial Fund had been held, and that it was decided that the balance of the fund be handed over to the Institute of Surveyors to help defray the cost of publishing the late Professor Skertchly's "Birribon, or The Valley of the Nerang."

EVENING MEETING, Monday, 17th November, 1930.—The President (Mr. C. T. White) occupied the chair, and twenty-eight members were present. Mr. T. Lawton was elected a member of the Club. Mrs. Comrie-Smith gave an interesting account of the recent visit of the members of the R.A.O.U. to Biggenden and Fraser Island. Mr. J. E. Young exhibited fruits of the Burdekin Plum (Pleiogynium Solandri) from a tree in his garden at Sherwood, and several natural history photographs. The President tabled a collection of plants made on the Club's Spring Excursion to Tugun. A couple of Pipe Fish were exhibited by Mr. Tilse.

ANNUAL MEETING, Monday, 16th February, 1931. —The retiring President (Mr. C. T. White) delivered an address on the Acacias or Wattles, of the Brisbane District. The flowering plants of Australia, the lecturer said, number approximately 10,000 species, divided into numerous families, by far the largest of which is the Leguminosae, with about 1,100 species. To this family belong the Wattles and many other beautiful Australian flowering shrubs. Wattles are not confined to Australia, but find their greatest development in this country. Of the 500 species known from various parts of the world about 400 are found here.

The Wattle has been taken as the national flower of Australia, firstly, as it is emblematic of Australian sunshine; secondly, as various Wattles are found in all the Australian States; and thirdly, as probably no month of the year is without at least one or two species being in flower.

In the immediate neighbourhood of Brisbane about twenty species are found. The lecturer dealt with these in detail, giving the differences between the species.

Mr. F. N. Ratcliffe, who had been in Australia for some time past studying the flying fox problem on behalf of the Council for Scientific and Industrial Research, showed a few cinema films of his journeys in North Queensland. In addition to a film of flying fox camps,

Mr. Radcliffe showed an interesting series of general natural history pictures, one moving picture of special interest being that of the Satin Bower Bird in its bower.

Mr. J. E. Young exhibited specimens of the Cardwell Lily (Eurycles amboinensis), grown in his garden.

Officers for the year were elected as set forth on the inner page of the cover of this issue.

EVENING MEETING, Monday, 16th March, 1931.—The Vice-President (Mr. F. A. Perkins) occupied the chair, and about 40 members were present. Mr. and Mrs. Arundel and Miss M. Holdsworth were elected members of the Club. A very interesting lecture on the Bunya Mountains, illustrated by a large series of lantern slides, was given by Mr. J. Nebe. Reports on the excursion to Petrie on Saturday, 14th February, were given by Mr. G. H. Barker (Birds) and Mr. C. T. White (Botany). Dr. E. O. Marks exhibited specimens of turquoise from Plunkett sent in by Mr. D. Curtis, and some from Dayboro District.

EVENING MEETING, Monday, 20th April, 1931.—The President (Mrs. Estelle Thomson) occupied the chair, and about 35 members were present. Mrs. B. A. Latimer and Miss P. Burdon were elected members of the Club. Reports on the Easter excursion to Canungra were given by Mr. J. E. Young (General), Mr. G. H. Barker (Birds), and Dr. E. O. Marks (Geology). A collection of plants made on the March excursion of the Club to Nursery Road, Mount Gravatt, were shown by Mr. C. T. White, the most interesting find being a large patch of the rare *Eucalytus curtisii*. Mr. L. Franzen tabled a miscellaneous collection of insects from Roma, Western Queensland, including eight specimens of a rare (probably new) Antlion. A few miscellaneous specimens collected during the Easter excursion were tabled by Mr. Ken. Jackson. A fruit-bat which had been killed on the electric light wires was shown by Mr. J. E. Young. A seed-bearing spray of the tree *Pittosporum undulatum* was shown by Mr. Tilse. Mr. J. Nebe showed some young trees killed by electric current, and gave a few interesting notes on the effect of electricity on vegetation, particularly trees; he also showed some excellent photographs of lightning recently taken by him.

EVENING MEETING, Monday, 18th May, 1931.—The chair was occupied by the President (Mrs. Estelle Thomson), and about 40 members were present. Miss Williamson was elected a member of the Club. Reports on the recent excursion to Mount Samson were given by J.

O'N. Brenan (Birds) and Mr. A. Brimblecombe (Insects). A very interesting lecture on "The Perfumes of Plants" was delivered by Dr. D. A. Herbert. Specimens of the fruit of *Pithecolobium Hendersoni* were staged by Mr. J. E. Young.

EVENING MEETING, Monday, 15th June, 1931.—The President (Mrs. Estelle Thomson) occupied the chair, and 33 members were present. Mrs. D. Urquhart and Mr. N. G. Mills were elected members. Mr. F. Kunze gave a short talk on "The Way Plants Live," illustrating his remarks with coloured diagrams and charts. Mr. G. H. Barker exhibited a series of specimens of wrens (Malurus spp.), showing the diffeernces in the markings in the various species.

ANNUAL REPORT.

For Year ending January 31st, 1930.

Ladies & Gentlemen,—

The Council of the Queensland Naturalists' Club has pleasure in submitting the Twenty-fifth Annual Report of the work of the Club.

Meetings.—Nine Council Meetings, 9 Monthly Meetings, 2 Special Meetings, a Wild Flower Show, and 11 Field Excursions have been held during the year.

Attendance at Council Meetings has been as follows:—Mr. White 8, Mrs. Thomson 7. Mr. Simmonds 7, Miss Baird 9, Mr. Sylow 8, Mrs. Jackson 8, Miss Grimes 4, Mr. Young 9, Mr. Barker 7, Mr. Nebe 8 Dr. Marks, 8, Dr. Herbert 5, Mr. Sanderson 6, Dr. Whitehouse 1. Miss Grimes asked to be relieved of the duties of Hon. Secreary of Nature Lovers' League.

The attendance at the Monthly Meetings has been good, the average being 36. During the year, lectures, illustrated in some cases with lantern slides or specimens, were given by Professor E. J. Goddard, Mr. J. E. Young, Mr. C. E. Hubbard and Mrs. Comrie-Smith. Exhibits and Reports of Excursions were made by Messrs. C. T. White, L. Franzen, J. E. Young, J. H. Simmonds J. Nebe, Drs. Marks and Herbert, and other members.

The Special Meetings were held on May 27th and June 9th, respectively, when advantage was taken of the visit of Messrs. E. E. Pescott and A. G. Hamilton for the meetings of the Australasian Association for the Advancement of Science, and most interesting lectures were given by them.

On Tuesday, June 3rd, visiting members of the A.A.A.S. were invited to be present at the Club's excur-

sion to Goodna and Woogaroo Scrub, and a large number availed themselves of the opportunity to meet members of our Club and to participate in what proved a very enjoyable excursion.

As the Club's representative to the A.A.A.S. meetings, a report was given by Dr. Whitehouse.

The Wild Flower Show and Natural History Exhibition was held on Saturday, September 13th. The exhibits were good and the success of the show was greatly due to the many friends who sent flowers and other specimens.

Excursions.—These included a trip to Amity Point at Easter, two week-end trips, one to "Hope Dale," Albert River, in August, and one to Tugun in September; two whole-day excursions to Gold Creek on Labour Day and Goodna on King's Birthday, respectively, and Saturday afternoon trips to Belmont, White's Hill, Sunnybank, The Blunder and Enoggera Reservoir.

A notable event in Natural History matters was the holding of the Congress of the R.A.O.U. this year in Queensland. The Club invited visiting members to a field outing to the Sandgate Lagoons, and entertained them to afternoon tea. His Excellency the Governor (Sir John Goodwin), who was present, spoke eulogistically of the work of bodies such as the R.A.O.U. and the Queensland Naturalists' Club, and gave some notes on his personal observations of birds in Queensland, India, and other countries.

Membership.—Sixteen new members have been elected during the year, and eight have resigned. Club membership now stands at 148.

A pleasing feature of the year was the appearance, for the first time in Queensland, of an effective Bill for the preservation of the Native Flora. We feel this was due in the first instance, to the action of Dr. Vernon, of Thursday Island, interesting himself in the protection of the beautiful orchid flora of Torres Strait, which has suffered severely from the depredations of both private and commercial orchid hunters.

Nature Lovers' League.—There was no great activity during the past year in the work of the League; some certificates were sold and lectures given to second year trainees at the Teachers' Training College by Dr. D. A. Herbert, Dr. F. W. Whitehouse, and Mr. G. H. Barker. The opportunity was taken during a visit to Brisbane of Mr. A. H. Chisholm to discuss with him the prospects of renewed activities in the work of the League.

"Queensland Naturalist."—It is regretted that owing partly to pressure of other work on the part of the Editor (Mr. C. T. White) and to lack of material from members only two issues of the "Queensland Naturalist" were published during the year.

At the beginning of the year, The Aquarium and Terrarium Society of Queensland affiliated with the Club.

C. T. WHITE, President.
E. E. BAIRD, Hon. Secretary.

QUEENSLAND NATURALISTS' CLUB.
Librarian's Report, 1930.

Magazine Section.—During the past year a total of 401 publications were received by way of exchange for the Club's magazine, as against 382 of the previous year. Of these 81 were Australian, 31 British, 134 European, 154 American, and 1 South African. Of these magazines and pamphlets 139 have been lent, as against 57 of the past year. A new and very popular addition to this section is the National Geographic Magazine. Another publication received by this Club for the first time last year is the "Natur und Museum," printed wholly in the German language, and with very fine illustration. "The Ostrich," a South African publication, was also received for the first time during the year.

Book Section.—In this section the volumes now number 37, four new volumes having been donated during the past year, prominent among these latter being "Australian Rain-forest Trees," presented by the author, Mr. W. D. Francis. These books have been lent 79 times during the past year as against 57 the year before, showing the increasing popularity of this section.

Owing to the steady increase in the numbers of magazines, books and pamphlets received by the Club, the library accommodation continues to become more cramped and the contents more congested, in spite of many parcels of literature least in demand being kindly stored by various members. This overcrowding is a great disadvantage, as, apart from the difficulty of keeping the overflowing shelves in order, a large number of the smaller magazines and pamphlets cannot of necessity have sections to themselves, and are therefore by no means easy to get at. Under the circumstances another bookcase is an urgent necessity and would be a great advantage both to the library and those using it.

EVA M. JACKSON, Hon. Librarian.

QUEENSLAND NATURALIST CLUB.

Annual Receipts and Expenditure. 31st December, 1930.

RECEIPTS.	£	s.	d.
To Cash at Bank's, January, 1930	47	8	6
„ Members Subcriptions	47	7	6
„ Donations	1	10	0
„ Tent Hire		10	0
„ Flower Show	42	18	3
„ Sale of Naturalist	1	10	0
„ Lantern Hire	1	0	0
„ Surplus from Excursions	3	8	8
„ Interest in Government Savings Bank	1	10	5
	£147	3	4

EXPENDITURE.	£	s.	d.
Printing of Naturalist	22	18	6
„ „ Book of Rules	3	0	0
Rent	12	5	0
Secretary Petty Cash	15	0	0
Flower Show	25	14	0
Insurance		5	11
Wild Flower Name Committee	1	0	0
Lantern Hire		10	0
Affiliation to Horticultural Society		10	6
Cash at Banks	65	19	5
	£147	3	4

C. W. HOLLAND, Hon. Auditor.

NATURE LOVERS' LEAGUE.

Annual Receipts and Expenditure. 31 December, 1930.

RECEIPTS.	£	s.	d.
To Balance at Bank, January, 1930	10	11	8
„ Sale of Certificates		10	2
	£11	1	10

EXPENDITURE.	£	s.	d.
Insurance		3	0
Balance at Banks	10	18	10
	£11	1	10

C. W. HOLLAND. Hon. Auditor.

GENERAL REPORT ON EASTER OUTING (1930) TO CANUNGRA.

(By J. E. YOUNG.)

The Easter outing was again held at the same place where such an enjoyable time was spent in 1928, near Canungra, and between Tambourine Mountain and Beechmont, which form the approaches to the MacPherson Range in this part.

The site is a peculiarly interesting one on an extensive reach of the Coomera, backed up by a river crossing, and the approach to it, of some half mile after leaving the main Beechmont Road is one of natural beauty, the track winding gradually downward through a splendid thickly wooded area composed largely of Brisbane box (Tristania conferta), stately ironbarks and grey gums, stringy-bark and tallow-woods, with an occasional bloodwood; a strip of vine-scrub or rain forest in a gully to the left contains a sprinkling of hoop pines, while another moister portion carries a patch of melaleucas.

The forest portion partly owes its appearance to the fact that the owner, Mr. W. G. Franklin, has continually encouraged the growth of straight and marketable timbers or forest conservation with noticeable results.

Owing to the good season, plant life generally was noticeably luxuriant, moss carpeting the stony banks of the river, and hanging from trees, and many fruiting trees, shrubs and vines being seen, the dark yellowwood (Rhodosphaera rhodanthema) being particularly noticeable, also the river cherry (Eugenia paniculata) on the lagoon banks which was in full flower, and also bearing its crimson fruit in considerable quantity. Despite the time of year many other herbaceous flowers were seen.

On Saturday a trip was arranged for Beechmont, but the truck engaged to carry the party unfortunately broke down decisively after a couple of miles. However, the younger and more active members continued by a short cut timber track through the scrub up the mountain side, and though passing wild and interesting country, their trip was too hurried and trying to have results of much value. One stone axe, however, was discovered, and the tree tomato (Cyphomandra betacea) was found, having gone wild from cultivation.

A walking tour to Tambourine Mountain took up the day on Sunday, the splendid flooded gums and fine specimens of tallowwoods were greatly admired. A few members went as far as the St. Bernard Falls.

On Monday nearly all the party were able to take a trip on a private timber tramway, by courtesy of Mr. Romeo Lahey, into the foothills adjoining the National Park, where the beauties of natural scrub have been conserved except for the removal of a quantity of milling pine. Unfortunately neither Botanists nor Entomologists were represented except by amateur observers. Ornithologists, however, report good results, and our geologist found most interesting features to study.

The party of thirty-three all told returned home on Monday evening well satisfied with the result of a pleasant week-end.

BIRDS RECORDED AT THE EASTER CAMP (1930). CANUNGRA.

(By G. H. BARKER and H. G. BARNARD.)

(Note.—Only vernacular names are used in this list, and are taken from the Official Check List of the R.A.O.U.)

Painted Quail.—A pair were flushed in some bracken fern near the slaughteryard.

Red-crowned Pigeon.—A beautiful male bird was seen in a ficus tree near the junction of Back Creek with the Coomera.

Pheasant Pigeon.—Seen in a patch of scrub on the tramline.

Top-not Pigeon.—A flock of about twenty of these fine pigeons were seen feeding in a large fig-tree on the tramline, near Flea Villa.

Bar-shouldered Dove.—Seen near the camp.

Peaceful Dove.—Seen near the camp, and along the tramline.

Green-wing Pigeon.—A single bird was seen on the ground in the big scrub at the end of the tramline.

Southern Stone Curlew.—Heard calling at night near the camp.

White-faced Heron.—Solitary birds were seen along the creek near the tramline.

Nankeen Kestrel. Seen on dead trees near the tramline. This was the only hawk identified.

Rainbow Lorikeet (Blue Mountain).—Seen and heard near the camp, and several flocks were disturbed from the timber along the tramline.

Scaly-breasted lorikeet.—Seen on several occasions.

Glossy Black Cockatoo.—A single bird flew over the camp one morning, and a pair were afterwards seen feed-

ing in a casuarina tree. This is the smallest of the black cockatoos and has a red tail.

Crimson Rosella.—Flocks of these beautiful parrots were seen along the creek near the tramline.

Pale-headed Rosella.—Seen on a number of occasions and sometimes in company with the crimson Rosella.

Tawny Frogmouth.—One of these birds settled on the end of one of the tent poles, a three-cell torch was held within a foot of the birds' head, but it only turned its head sideways and gazed into the light without even blinking. A pair was disturbed from their roosting tree in the daytime.

Laughing Kookaburra.—A common bird in forest country.

Forest Kingfisher.—A solitary bird was seen, perched on a dead stick over a waterhole, evidently on the lookout for small fish.

Pheasant-coucal.—Two fully-fledged young birds were perched on a bush near the tramline, and several old birds were also seen.

Welcome Swallow.—Seen in Canungra and also along the tramline.

Australian Tree-Martin.—Seen flying about the hollow spouts of a clump of gum trees.

Fairy Martin.—Plentiful about Canungra.

Willie Wagtail.—Quite a number of these friendly little chaps were seen.

Grey Fantail (white shafted).—These little birds were fairly common, generally seen darting about where tree-tits were feeding.

Leaden Flycatcher.—Only seen on one or two occasions.

Southern Yellow Robin.—Frequently seen about patches of scrub and in the forest near scrub.

Pale Yellow Robin.—A pair were seen in the big scrub at the end of the tramline.

Golden Whistler.—Seen about the scrubs and along the gullies.

Rufus Whistler.—A pair were seen early one morning close to the camp.

Grey Shrike-Thrush (Harmonious).—Seen in the forest country.

Rufus Shrike-Thrush.—Seen in the big scrub at the end of the tramline.

Magpie Lark.—Frequently seen.

Eastern Whip-Bird.—Heard in all the scrubby patches. The lantana provides good shelter for these birds.

Black-faced Cuckoo-Shrike.—Seen near the camp, also

in the big timber along the tramline.

Grey-crowned Babbler.—A small flock seen on a ridge near the tunnel, on the tramline.

Little Thornbill (Weebill).—Seen feeding in the branches of trees about the scrubs.

Brown Thornbill.—Seen in the creek near the camp, also in the big scrub at the end of the tramline.

Buff-tailed Thornbill.—Seen near the camp, also in some low bushes on Back Creek.

Yellow-tailed Thornbill.—Seen on several occasions.

White-browed Scrub Wren.—Seen in lantana near the road on Tambourine Mountain. They were feeding with a company of wrens (Malurus lamberti).

Variegated Wrens (Malurus lamberti).—Seen along the Tambourine Mountain Road and other localities. Several males in full plumage were seen.

Red-backed Wren.—Seen among the bracken fern and long grass, fairly common.

Dusky Wood Swallow.—Seen near the tunnel on the tramline. They appeared to be catching flying ants.

White-headed Tree-Runner.—Seen in small flocks, generally in company with other small birds. They were searching the limbs and tree trunks for insects.

White-throated Tree-creeper.—Seen frequently working the tree trunks in search of insects. The tree-creepers start low down near the ground and work up the trees. The tree-runners start at the top and work down.

Mistletoe Bird.—Only seen a few times.

Spotted Pardalote.—Frequently seen feeding among the tree-tops, in company with tree-tits.

Black-headed Pardalote.—Seen and heard on several occasions.

Grey-breasted Silver-Eye.—Only seen a few times.

White-naped Honey-eater.—Seen a number of times feeding in the leaves at the ends of branches.

Lewin Honey-eater.—A very common bird, seen and heard lots of times.

Yellow-faced Honey-eater (Chick-up).—Only seen on two occasions.

Noisy-Miner.—Seen in every locality visited.

Blue-faced Honey-eater.—Several of these birds passed over while the party was waiting at Canungra for the timber train and at camp.

Friar Bird.—Seen in a flowering Eucalypt on the ridges between the camp and Back Creek.

Zebra (Chestnut-eared) Finch.—A male bird in full plumage flew out of a bush growing beside the line in the open country near the big scrub.

Red-browed Finch.—This little bird was common in the undergrowth. One flew from a nest when it was about to be examined.

Double-barred Finch.—Small flock in Canungra.

Green Cat Bird.—Seen in the big scrub near the end of the tramline.

Magnificent Rifle Bird.—A pair were seen in the same locality as the cat birds.

Australian Crow.—Seen flying over the camp and also about the slaughteryard about a mile from camp.

Pied Currawong.—Frequently seen and heard. Though these birds have been slaughtered as a pest, for some years they still seem to be holding their own.

Pied Butcher Bird.—Frequently seen in the dead timber along the creek flats.

Grey Butcher Bird.—Seen and heard many times in the timbered country.

Black-backed Magpie.—Often seen and heard in the open country. A pair at the camp met with a sad end.

The number of birds recorded, 64, was very fair. A few others were seen, but as they were not actually identified they were not included in the list.

Either from the fact of it being too late in the season, or rain hanging about, the birds were very quiet. No owls or other night birds were heard calling.

AN ACCOUNT OF THE R.A.O.U. EXCURSION TO BIGGENDEN AND CAMP OUT AT FRAZER ISLAND, OCTOBER, 1930.

(Read before the Queensland Naturalists' Club, 17th November, 1930.)

(By Mrs. COMRIE-SMITH.)

On Friday, 10th October, twenty members of the R.A.O.U. left Brisbane for a ten days' camp-out on Frazer Island.

The first week-end was spent at Biggenden, where the Mayor and Council gave us a very good time, though unfortunately the Saturday was wet. On Sunday some of us were taken by Mr. L. A. Hall, of Goomeri, in his car to Degilbo Creek, which runs at the foot of Biggenden Bluff, a huge mass of rock rising straight out of the plain about 2,000 feet high.

We left before 6 a.m. and as the car moved slowly along the road, the first bird we saw was a blue-winged Kookaburra (Dacelo leachi), whose most noticeable dis-

tinction is the dull grey of his breast and the vivid blue on wings and back; his call is loud and harsh, with no suggestion of laughter. Then we saw a pair of grey jumpers (Struthidea cinerea) building a nest in a tree by the roadside. It is very like a pee-wee's nest, placed on a horizontal branch and built of mud. Stopping to look at twelve zebra finches (Taeniopygia castanotis) sitting in a gay little row on the fence, we saw a pair of black-headed pardalotes (Pardalotus melanocephalus) going in and out of their hole in the bank.

A little wood swallow (Artamus minor) perched on a fence long enough for us to see that it has no white on its tail as the dusky wood swallow has. Tree martins (Hylochelidon nigricans) were building in a dead gum, some going in at a hole at one side and some at another—community nesting. A number of double-bar finches (Steganopleura Bichenovii) were the first our Victorian visitors had seen, and they found a nest half built, a grass nest with a bottle neck very like that of a red-browed finch (Aegintha temporalis) but rather neater.

A pippit (Anthus australis) ran before us over the grass and then rose with its curving flight, showing the white on the outer tail feathers. As we left the car beside the road where there was a small piece of water with some reeds under a huge gum tree, a pair of black ducks (Anas superciliosa) flew up; a restless fly-catcher (Seisura inquieta) evidently had a nest high up in the tree. We walked across the creek, which was very beautiful in the early morning light, with great trees about it and sloping grassy banks with bushes overhanging the water in some places and in others a wide gravelly shore, the water rippling and gurgling over stones, and the shoulder of the great Bluff as a background.

A blue-faced honey-eater (Entomyzon cyanotis) was nesting in an old babbler's nest, and there were numbers of these handsome birds about. A koel (Eudynamys orientalis) was calling and flying round, and probably had its egg in one of the honey-eaters' nests. A pied butcher bird (Cracticus nigrogularis) had a nest high up in a stringybark. There were numbers of scaly-breasted lorikeets (Trichoglossus chlorolepidotus), one small young one was rescued dripping from the creek and most ungratefully made fierce bites at the fingers of its rescuer with its sharp beak. It was very interesting to see its lovely colouring at such close quarters.

There were gorgeous rainbow or Blue Mountain lorikeets (Trichoglossus moluccanus), too, and several orioles (Oriolus saggitatus), another bird which is an unwilling

host of the koel. There was a pair of red-backed wrens (Malurus melanocephalus) in the long grass at the top of the bank with a family of nearly full-grown young ones. An azure kingfisher (Alcyone azurea) flashed down the stream and on the opposite bank a brown honey-eater (Glyciphila indistincta) had a nest with young in it, in a low bush overhanging the water. We crossed the creek and went down on the opposite side where we saw a black bittern (Dupetor flavicollis) leave its nest of sticks high up in a pine tree over the water.

On the return to Biggenden we saw a flight of black cockatoos (Calyptorhynchus funereus) overhead call as they flew aloft in a long string, 17 of them.

After breakfast we went with a large party in a dozen cars to the Forestry Reserve—a fine stretch of wonderful rain-forest with a good track cut right through it. Here some of us saw the noisy pitta (Pitta versicolor), a difficult bird to see, being mostly green and keeping to the thick undergrowth. A lovely sight further along the track was at a spot where some tall callistemons were a mass of red flowers, and darting about among them numbers of scarlet honey-eaters (Myzomela sanguinolenta), their glowing colour even more vivid than the flowers; there were dozens of them and the air was full of their short, sharp call notes.

The scrub was too thick to see birds except those that crossed the track, many lewin honeyeaters (Meliphaga lewini), some rufus thrushes (Colluricincla megarhyncha), and a green pigeon or two.

At mid-day we were entertained to a splendid picnic lunch provided for us by the ladies of Biggenden; there were sixty people there, so it was no light undertaking, and everything was of the best. After doing full justice to this excellent lunch we wandered about the beautiful paths through the scrub for two or three hours and came back to find another spread in the shape of afternoon tea ready for us. We had a beautiful drive through grass paddocks and across many creeks back to Biggenden.

Next morning we were shown over the fine Butter Factory, one of the most up-to-date in Queensland. We left after lunch and the Mayor and Councillors and many other people gave us a great send-off at the station. Everyone at Biggenden was most kind and made our stay there very enjoyable.

We spent the night at Maryborough, and next morning before leaving spent some time in the beautiful park which was full of birds—fig-birds (Sphecotheres vieilloti) in

scores, friar-birds (Philemon corniculatus) and orioles (Oriolus saggitatus), all feeding in the great fig-trees, and honey-eaters of several kinds, including the black-chinned (Melithreptus laetior), which is so like the familiar white-naped (M. lunatus). There was a varied triller (Lalage leucomela) with a nest in a tall pine-tree, and sitting on its one egg which is the usual clutch for the species. The nest is very small and exceedingly shallow for the size of the bird, which, when brooding, entirely hides the nest from view.

We left Maryborough at 10 a.m. on the Government steamer "Relief" and sailed down the Mary River for 20 miles, and then five miles across the Bay to Fraser Island.

We saw a number of birds going down and again going up on our return journey. There were the lordly white-breasted sea-eagle (Haliaeetus leucogaster), and the even more beautiful red-backed sea-eagle (Haliastur indus); one of these had a fish in its claws which it fed on as it floated lazily along. There was a great white osprey (Pandion haliaetus) perched high up in a tree; whistling eagles (Haliastur sphenurus), hawks and harriers, crested terns and silver gulls, pelicans and shags were all numerous. There were about a dozen black swans (Chenopis atrata), a great white egret (Egretta alba), a white-faced heron (Notophoyx novae-hollandiae), two darters (Anhinga novae-hollandiae), and at last, what our Victorian visitors were very anxious to see, two jabirus (Xenorhynchus asiaticus).

We were taken first on the timber train and then in a four-horse German waggon to the Forestry camp, where a large empty house was placed at our disposal by the kindness of the Forestry Board, which made a very comfortable nucleus for our camp.

We thought at first that there were not going to be many birds, but eventually we found a good many, though it is certainly not an ideal bird locality. By far the most numerous species was the little brown tit (Acanthiza pusilla). One could hear their little "tzit-tzit" ending in a sweet warble in every bush. There were a great many lewin honey-eaters (Meliphaga lewini), and we found the nest of one with two eggs in it, pearly white, with minute reddish dots and blotches. The nest was a beautiful thing, suspended from two thin twigs of a pine-tree about twelve feet up. It was made chiefly of thin strips of paper-bark fastened with spider-web and laced all over with strands of bright green moss, and was thickly lined with the brown velvety down of the Macrozamia Douglasii.

There were a few varied trillers (Lalage leucomela) and some white-cheeked honey-eaters (Meliornis nigra), the nest of which was also found. Another honey-eater new to us all was the dusky (Myzomela obscura), a little brown bird with a rufous breast and the curved bill of its kind; in one flowering eucalypt there were dozens of them; they are confined to Northern Australia and Queensland.

There was a giant fig-tree near the camp which attracted numbers of birds, mostly fig-birds (Sphecotheres) vieilloti), but we also saw several pigeons, the white-headed (Columba norfolkiensis), the green-winged (Chalcophaps chrysochlora), the red-crowned (Ptilinopus ewingi), a bird of many colours, and the wompoo (Megaloprepia magnifica) and the pheasant pigeon (Macropygia phasianella). On this tree we saw the rare barred cuckoo-shrike (Coracina lineata) several times, and there were many lewin honey-eaters and a bronze cuckoo.

The whip-birds (Psophodes olivaceous) were very numerous round the camp. They began calling at the earliest dawn but not before the yellow robins (Eopsaltria chrysorrhoa). The rufous thrush (Colluricincla megarhyncha) was the finest singer in the early morning, with its full flute-like song. A great contrast to it were the black cockatoos (Calyptorhynchus funereus) and the white ones (Kakatoe galerita), too, these great birds looked lovely sail-high up in the air with the sun on their dazzling plumage tinged with yellow under the wings as though the sunlight were shining through.

There were a few drongos (Chibia bracteata) with their peculiar half harsh, half musical calls; dollar-birds (Eurystomus orientalis), too, their call rather like a duck's quack.

A spectacled fly-catcher (Monarcha trivirgata) and its nest were found, and rarest of all, a white-eared fly-catcher (Carterornis leucolis) was found with its nest. "The Emu," speaking of this find, says, "the taking of the first authentic eggs of this species was probably the most important piece of ornithological work achieved at a Union Camp-out for many years."

A pair of rainbow-birds (Merops ornatus) had a burrow near the house, and with the aid of a mirror we could see the five white eggs in the nest chamber at the end.

We visited a lake five miles from the camp but found almost no life on it, a few musk-duck (Biziura lobata) and a cormorant (Phalacrocorax sp?), nothing more on the water but on the shores were white-cheeked and lewin and scarlet honey-eaters (Myzomela sanguinolenta), mis-

tletoe-birds (Dicaeum hirundinaceum), king parrots (Aprosmictus scapularis) white-throated tree-creeper (Climacteris picumnus), rufous and grey shrike-thrush and the ubiquitous brown tit (Acanthiza pusilla).

We left the camp with many regrets, packed into the waggon, and then on to the timber train, and at last found ourselves again on board the "Relief" starting on the 25 mile run up the Mary River.

THE 'POSSUM SEASON.

(By J. E. YOUNG.)

Alas! The word has gone forth! An "open season" for 'Possums has been declared in this State.

The announcement was in the nature of a surprise to us, for we had been given to understand that the danger for this year had passed, but the strenuous economic period is given as a reason.

Readers will doubtless be aware that this Club has consistently fought against the far too rapid extermination of this interesting marsupial, and its cousin, the Native Bear, as well as other disappearing species.

It is to be hoped that the regulations will be rigidly observed on this occasion, especially regarding spotlight shooting and sanctuaries; for although the gun is probably more humane than the noose, it gives the animals no chance, and an almost clean sweep is made; this is bound to include the protected "Bear," as the difference cannot well be detected with the light, and our very small remaining number of these will be sadly reduced.

Possibly some of our members may be able to advise the authorities of detected or suspected breaches of the law, with a view to action.

One is apt to wonder if the institution of some form of 'possum farming might not prove a solution, by which the extermination may be averted, and an industry preserved, for though some quarters report "'possums plentiful," we know from actual experience what such reports are worth.

May the 'possums' worst days soon be over is the hope of all true Nature lovers.